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Vol. 1055 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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June 4, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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ENGINEERING LIBRARY

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
May 7, 1985. *Acting Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on June 1, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,332,033 through 4,333,178

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,942,338, Re. S.N. 636,070, Filed July 30, 1984, Cl. 464/34, TORQUE LIMITING COUPLING, James Furlette, et al., Owner of Record: *Inventors,* Attorney or Agent: Ernest I. Gifford, Ex. Gp.: 342

4,381,288, Re. S.N. 725,443, Filed Apr. 22, 1985, Cl. 423/101, MERCURY BRINE SLUDGE TREATMENT, Samuel Weiss, et al., Owner of Record: *Stauffer Chemical Co., Westport, Conn.,* Attorney or Agent: Roger S. Benjamin, et al., Ex. Gp.: 113

4,383,327, Re. S.N. 725,433, Filed Apr. 22, 1985, Cl. 378/019, RADIOGRAPHIC SYSTEMS EMPLOYING MULTI-LINEAR ARRAYS OF ELECTRONIC RADIATION DETECTORS, Robert A. Kruger, Owner of Record: *The University of Utah, Salt Lake City, Utah,* Attorney or Agent: James T. Hoffman, et al., Ex. Gp.: 256

4,395,420, Re. S.N. 724,338, Filed Apr. 17, 1985, Cl. 424/278, METHOD AND COMPOSITION FOR TREATING PRURITIS, Joel E. Bernstein, Owner of Record: *Jaye Boern Laboratories, Inc., Northbrook, Ill.,* Attorney or Agent: Ronald A. Sandler, et al., Ex. Gp.: 125

4,416,408, Re. S.N. 724,830, Filed Apr. 19, 1985, Cl. 228/019, SOLDER REMOVING DEVICE, Ernst Spirig, Owner of Record: *Inventor,* Attorney or Agent: Lawrence E. Laubscher, Sr., et al., Ex. Gp.: 325

4,482,051, Re. S.N. 712,251, Filed Mar. 15, 1985, Cl. 206/392, SHIPPING PALLET, Bryant W. Cantey, Jr., Owner of Record: *C & R Container, Inc., Greenville, S.C.,* Attorney or Agent: John B. Hardaway, III, Ex. Gp.: 241

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,760,331, Reexam. No. 90/000,766, Requested: Apr. 26, 1985, Cl. 339/36, ELECTRICAL CONNECTING DEVICE FOR INSULATED WIRES, Grey Manning Gurley, Owner of Record: *AMP Investment, Inc., Harrisburg, Pa.,* Attorney or Agent: William J. Keating, Ex. Gp.: 215, Requester: Molex, Inc., Chicago, Ill.

4,416,508, Reexam. No. 90/000,772, Requested: Apr. 26, 1985, Cl. 350/96.21, OVERHEAD ELECTRIC AND OPTICAL TRANSMISSION CABLES, Philip Dey, et al., Owner of Record: *BICC Public Limited Co., London, England,* Attorney or Agent: Eugene F. Buell, Ex. Gp.: 251, Requester: Alcoa-Fujikura, Ltd., Los Angeles, Calif.

COMMISSIONER ORDERED REEXAMINATIONS

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

4,497,254, Reexam. No. 90/000,776, Requested: May 10, 1985, Cl. 104/1R, ISOLATING DEVICE FOR AN OPENING TRAVERSED BY CONVEYOR CARS, Siegfried Schmidt, Owner of Record: *Buropatent AG, Glarus, Switzerland,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 312, Requester: Commissioner

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Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

North American Fan Co., aka, N.A.F. Co., Inc., Dallas, Tex., Reg. No. 1,231,783, for the mark "PARK PLACE", Canc. No. 14,401.

Simco-Pacific, dba, American Sport Co., Oakland, Calif., Reg. No. 951,818, for the mark "AMERICAN SPORT", Canc. No. 14,460.

Artronix, Inc., St. Louis, Mo., Reg. No. 924,153, for the mark "ARTRONIX AND DESIGN", Canc. No. 14,516.

General Natural Corp., New York, N.Y., Reg. No. 1,159,117, for the mark "NATURAL LIVING", Canc. No. 14,522.

Louis Marx & Co., Inc., a Del. Corp., assignee by mesne assignment and merger of Louis Marx & Co., Inc., a N.Y. Corp., Glen Dale, W. Va., Reg. No. 844,946, for the mark "COMANCHE", Canc. No. 14,539.

San Francisco Shirt Works, Inc., San Francisco, Calif., Reg. No. 1,154,934, for the mark "SHAZAM AND DESIGN", Canc. No. 14,555.

Fairfield-Noble Corp., Farmingdale, N.Y., Reg. No. 1,035,974, for the mark "PALO ALTO AND DESIGN", Canc. No. 14,556.

Fred L. Runnels, dba, Metrin, Seattle, Wash., Reg. No. 1,287,587, for the mark "METRIN", Canc. No. 14,557.

Lowinger Imports Corp., Miami, Fla., Reg. No. 804,226, for the mark "LEONARDO" Etc. and design, Canc. No. 14,573.

Shez Sports International, Fairfield, N.J., Reg. No. 1,262,455. for the mark "SHEZ", Canc. No. 14,583.

Premier Eyewear Co., Inc., Englewood, N.J., Reg. No. 1,187,460, for the mark "PREMIER AND DESIGN", Canc. No. 14,596.

Energy Solutions, Inc., Stevensville, Mo., Reg. No. 1,142,354, for the mark "SOLAR SOLUTION", Canc. No. 14,625.

Heim Brothers Packing Co., Inc., Little Rock, Ark., Reg. No. 806,996, for the mark "RANCHERO BRAND", Canc. No. 14,630.

Thayer, Inc., assignee, by mesne assignment, of Thayer Co., Gardner, Worcester, Mass., Reg. Nos. 559,722, 561,691 and 568,652, for the marks "TOPS FOR TOTS" & Design, Canc. No. 14,728.

ERMA S. BROWN,
Deputy Clerk of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of June 4, 1985

D. 276,696	4,457,237	4,473,367	4,480,842
4,016,179	4,458,544	4,473,433	4,481,243
4,116,370	4,458,841	4,475,180	4,481,521
4,336,400	4,459,825	4,475,197	4,481,983
4,356,113	4,459,876	4,475,211	4,483,185
4,375,623	4,460,262	4,475,472	4,483,784
4,389,335	4,461,030	4,475,661	4,484,528
4,404,375	4,461,509	4,475,673	4,484,676
4,419,271	4,462,753	4,476,110	4,484,783
4,419,417	4,463,370	4,476,155	4,484,787
4,424,642	4,464,765	4,476,191	4,485,472
4,425,033	4,465,116	4,476,355	4,485,872
4,431,666	4,466,180	4,476,375	4,486,841
4,432,133	4,466,746	4,476,464	4,488,010
4,434,997	4,467,101	4,478,239	4,488,236
4,435,283	4,467,485	4,479,186	4,488,462
4,435,429	4,468,529	4,479,411	4,489,182
4,435,647	4,468,806	4,479,765	4,491,116
4,435,930	4,469,605	4,479,934	4,491,521
4,437,842	4,469,889	4,480,082	4,491,607
4,439,160	4,470,889	4,480,466	4,491,703
4,441,543	4,471,173	4,480,597	4,491,935
4,442,873	4,471,459	4,480,643	4,493,077
4,446,029	4,471,807	4,480,654	4,498,457
4,447,887	4,472,064	4,480,706	4,498,803
4,455,247	4,472,563	4,480,830	

Disclaimers

3,810,515.—*Ben Ingro,* Elmwood Park, Ill. WALL CLIMBING DEVICES. Patent dated May 14, 1974. Disclaimer filed Dec. 10, 1984, by the inventor.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,294,839.—*Thomas Doll,* Mainz; *Erich Schacht,* Seeheim-Jugenheim; *Hans-Eckart Radunz,* Muhltal and *Ernst Schulze,* Darmstadt, Fed. Rep. of Germany. BENZOTHIAZOLE DERIVATIVES AND PHARMACEUTICAL FORMULATIONS CONTAINING THEM. Patent dated Oct. 13, 1981. Disclaimer filed July 6, 1984, by the assignee, *Merck Patent Gesellschaft Mit Beschrankter Haftung.*

Hereby enters this disclaimer to claims 1, 3, 4 and 5 of said patent.

4,401,624.—*Charles B. Atwater,* Springfield, Mo. BUFFERED SOLUTIONS WHICH HAVE A REDUCED CORROSIVE NATURE. Patent dated Aug. 30, 1983. Disclaimer filed Dec. 20, 1984, by the assignee, *Syntex (U.S.A.) Inc.*

Hereby enters this disclaimer to all claims of said patent.

4,406,210.—*Alan C. Baker,* Huntington Beach, Calif., and *John E. Roach, Jr.,* Alexandria, Va. JET-PROPELLED MISSILE WITH SINGLE PROPELLANT-EXPLOSIVE. Patent dated Sept. 27, 1984. Disclaimer filed Mar. 28, 1985, by the assignee, *Brunswick Corp.*

Hereby enters this disclaimer to claims 11–16 of said patent.

4,512,420.—*Asadollah Hayatdavoudi* and *Ladd M. Adams,* Norman, Okla. DOWNHOLE VORTEX GENERATOR. Patent dated Apr. 23, 1985. Disclaimer filed Feb. 6, 1985, by the assignee, *Gill Industries, Inc.*

The term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Dedication

4,390,390.—*Dallas A. Margraf,* Spring Valley and *Fritz F. Treiber,* Centerville, Ohio. LABEL APPLICATOR DEVICE. Patent dated June 28, 1983. Dedication filed Mar. 11, 1985, by the assignee, *Hobart Corp.*

Hereby dedicates to the Public the entire term of said patent.

Disclaimers and Dedications

4,342,293.—*James W. Nickerson,* Mobile, Ala. VALVE GUIDE AND METHOD FOR MAKING SAME. Patent dated Aug. 3, 1982. Disclaimer and Dedication filed Apr. 1, 1985, by the assignee, *Teledyne Industries, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

4,484,547.—*James W. Nickerson,* Mobile, Ala. VALVE GUIDE AND METHOD FOR MAKING SAME. Patent dated Nov. 27, 1984. Disclaimer and Dedication filed Apr. 1, 1985, by the assignee, *Teledyne Industries, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4243
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	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 27, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	12-12-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	11-05-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-04-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	5-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	3-22-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	10-1-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-28-82
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-28-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	5-26-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-08-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	1-31-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-11-83

Expiration of patents: The patents within the range of numbers indicated below expire during April 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,375,529 to 3,381,302, inclusive

Plant Patents ..... Numbers 2,802 to 2,810 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JUNE 4, 1985

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

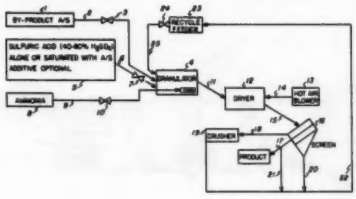
T105,501
GRANULATION OF CRYSTALLINE BY-PRODUCT AMMONIUM SULFATE

Cecil P. Harrison, Rte. 13, Box 41, Florence, Ala. 35630, and Cullen G. Tittle, 109 Monroe Dr., Tuscumbia, Ala. 35674

Filed Sep. 25, 1984, Ser. No. 654,278
Int. Cl.[3] C05B *3/00*
U.S. Cl. 71—61
2 Sheets Drawing. 28 Pages Specification

The present invention teaches a simple method for reclaiming principally the N and S values in by-product, fine, crystalline ammonium sulfate in a granular form eminently suitable for the preparation of direct application fertilizers and/or the incorporation into bulk-blending operations for the preparation thereof.

In the instant invention, normally from about seventy (70) percent to about eighty (80) percent of the ammonium sulfate product produced therefrom, is derived from feedstock comprising said by-product, fine, crystalline ammonium sulfate. Furthermore, in one embodiment for the practice of the instant invention, from about eighty (80) percent to about eighty-eight (88) percent of said fine, crystalline ammonium sulfate feedstock is directly incorporated thereinto with the remainder thereof being indirectly introduced thereinto by means of applicants' prepared special "binder." In another embodiment for the practice of the instant invention wherein same is effected juxtaposed an ammonium sulfate crystallizer unit the aqueous saturated ammonium sulfate mother liquor removed therefrom, with and/or without slurry fines therein may be admixed with water and sulfuric acid to prepare the binder solution for subsequent introduction into the inclined rotating drum. In this embodiment for the practice of the instant invention, all of the fine, crystalline ammonium sulfate feedstock may be directly incorporated into the upper end of said inclined rotating drum, i.e., by acidifying the mother liquor from the crystallizer it is not necessary to employ desolution of a sidestream of the by-product fines from the stockpile thereof.



GRANULATION OF BY-PRODUCT A/S

REISSUES

JUNE 4, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,903

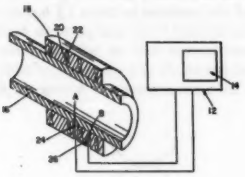
EXTRUDER TEMPERATURE CONTROLLER

Louie M. Faillace, Pawcatuck, Conn., assignor to Crompton & Knowles Corporation, Parsippany, N.J.

Original No. 4,262,737, dated Apr. 21, 1981, Ser. No. 48,974, Jun. 15, 1979. Application for reissue Apr. 13, 1983, Ser. No. 484,689

Int. Cl.[3] F28F *27/00;* B29F *3/00;* G05D *23/22*

U.S. Cl. 165—12 22 Claims



1. An extruder system having a barrel *having an axis and a plurality of zones at different positions along said axis,*

a shell surrounding said barrel *and having a plurality of zones corresponding to said zones of said barrel* and having heat exchange elements *for exchanging heat with said zones of said barrel,*

heat exchange element power means,

at least one pair of temperature sensitive elements *in each of said plurality of zones,* one of said pair being placed to sense the temperature adjacent the inner surface of said barrel, the other of said pair being placed to sense the temperature of said sheli, and

a controller having

temperature signal input means for receiving an independent temperature signal from [each] *said one temperature sensitive element and for receiving an independent temperature signal from said other temperature sensitive element* of said pair of temperature sensitive elements,

setpoint signal input means for inputting a setpoint signal representative of a desired barrel temperature setpoint *for each one of said plurality of zones of said barrel,*

storage means for independently storing [each of said input independent temperature signals and] *said independent temperature signal from said one temperature sensitive element, said independent temperature signal from said other temperature sensitive element, and* said input setpoint signal, and

control means responsive to said stored input setpoint signal and each of said stored input independent temperature signals *for each of said zones* to derive output signals *for each of said zones, said control means including means responsive to said stored input setpoint signal for providing a control signal for each of said zones, and means responsive to the deviation between said stored input setpoint signal and said stored input temperature signal from said one temperature sensitive element of said pair, for varying said control signal for each of said zones, said control means further including means responsive to said control signals, as varied by said means for varying a control signal, and said stored input temperature signal from said other temperature sensitive element of said pair, for providing said output signals for each of said zones,*

said heat exchange element power means being responsive to said output signals automatically to maintain the temperature of *each of* said *zones of said* barrel close to said input setpoint temperature *for each of said zones of said barrel.*

Re. 31,904

METHOD AND APPARATUS FOR RECYCLING ASPHALT-AGGREGATE COMPOSITIONS

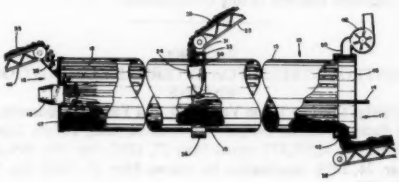
Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Original No. 4,215,941, dated Aug. 5, 1980, Ser. No. 12,657, Feb. 16, 1979. Division of Ser. No. 864,673, Dec. 27, 1977, Pat. No. 4,177,080, which is a continuation-in-part of Ser. No. 718,063, Aug. 26, 1976, Pat. No. 4,182,631, which is a continuation-in-part of Ser. No. 603,357, Aug. 11, 1975, Pat. No. 3,999,743. Application for reissue Jan. 18, 1982, Ser. No. 340,086

The portion of the term of this patent subsequent to Dec. 28, 1993, has been disclaimed.

Int. Cl.[3] B28C *5/46*

U.S. Cl. 366—25 13 Claims



1. Apparatus for heating and mixing asphalt-aggregate composition comprising

(a) an elongated rotatable drum having an input end and an opposite output end,

(b) means for supplying hot gases of combustion at said input end and for directing said hot gases substantially along the length of said drum between said input and said output ends whereby said composition is gradually heated therebetween,

(c) first means for supplying aggregate particles into said drum at a hot zone whereby said aggregate is directly exposed to said hot gases,

(d) second means for introducing asphaltic concrete particles comprising a mixture of asphalt and aggregate to said drum in a cooler zone whereby said asphaltic concrete is directly exposed to said hot gases in said cooler zone, and

(e) means for recovering heated and mixed composition at said output end.

Re. 31,905

METHOD AND APPARATUS FOR RECYCLING ASPHALT-AGGREGATE COMPOSITIONS

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Original No. 4,177,080, dated Dec. 4, 1979, Ser. No. 864,673, Dec. 27, 1977. Continuation-in-part of Ser. No. 718,063, Aug. 26, 1976, Pat. No. 4,182,631, which is a continuation-in-part of Ser. No. 603,357, Aug. 11, 1975, Pat. No. 3,999,743. Application for reissue Jan. 18, 1982, Ser. No. 340,087

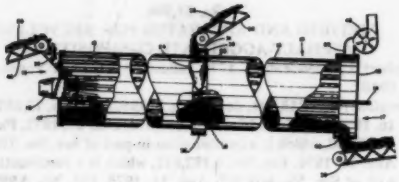
Int. Cl.[3] C08L *95/00;* B28C *5/46*

U.S. Cl. 106—281 R 18 Claims

1. A process for [producing asphalt-aggregate composition] *continuously recycling used asphaltic concrete* comprising *continuously* introducing *only* non-asphalt containing aggregate particles in a hot zone of a rotatable drum and gradu-

ally heating and advancing said aggregate toward an output drum end,

continuously introducing *only a mixture of coarse and fine* solid particles of used asphaltic concrete comprising a mixture of asphalt and aggregate radially into said drum downstream from said hot zone *at a single location* in a cooler temperature zone,



gradually mixing and heating said aggregate with said asphaltic concrete particles, and

adding and mixing liquid asphalt with [said] *the mixture of aggregate and asphaltic concrete* particles downstream from said hot zone to produce [said asphalt-aggregate] *an asphaltic concrete paving* composition.

Re. 31,906

CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

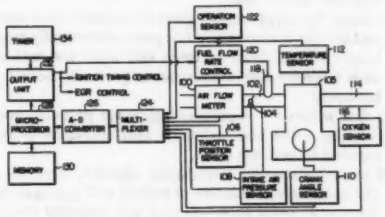
Yoshishige Oyama; Teruo Yamauchi, and Yutaka Nishimura, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,205,377, dated May 27, 1980, Ser. No. 899,159, Apr. 24, 1978. Application for reissue May 27, 1982, Ser. No. 382,692

Claims priority, application Japan, Apr. 22, 1977, 52-45795

Int. Cl.[3] **G06F** *15/20;* **F02D** *33/00*

U.S. Cl. 364—431.06 **14 Claims**



14. A control system for an internal combustion engine comprising: an air flow meter for metering the flow rate of intake air supplied to the engine and for producing an output signal relative to the flow rate of intake air; a plurality of sensors for detecting different conditions of engine operation; a microprocessor for carrying out digital computation on the basis of the output signal of said air flow meter and the output signals of said sensors thereby providing at least one control signal for the engine; fuel supply means for supplying fuel to the engine; and fuel flow rate control means for controlling the flow rate of fuel supplied by said fuel supply means according to said control signal; wherein said air flow meter includes means for producing, as said output signal relative to the flow rate of intake air, a non-linear signal having a non-linear characteristic such that the changing rate of said signal with respect to the flow rate of intake air is greater in a predetermined region in which the flow rate of intake air is smaller than in other regions of the flow rate of intake air, said control system further comprising means for converting said non-linear signal to a digital form, said microprocessor being supplied with said non-linear signal in a digital form for carrying out digital computation on the basis of said non-linear signal.

Re. 31,907

TETRAFLUOROETHYLENE COPOLYMER FINE POWDER RESIN

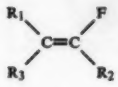
Robert V. Poirier, Fairport, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 4,036,802, dated Jul. 19, 1977, Ser. No. 616,442, Sep. 24, 1975. Application for reissue Jul. 18, 1978, Ser. No. 925,886

Int. Cl.[3] **C08L** *27/18;* **C08F** *259/08*

U.S. Cl. 525—276 **8 Claims**

11. An agglomerated fine powder resin whose agglomerated particles have an average size of between about 350μ and 800μ and are composed of primary particles [defined as provided in the definition of the particles in claim **1**] *having an average size of between about 0.1 and 0.5μ; said particles having at least two portions, an outer portion and an adjacent inner portion, each portion consisting essentially of a copolymer of units of tetrafluoroethylene and at least one comonomer having the formula*



(a)

wherein

R_1 independently is F;

R_2 independently is F;

*R_3 is Cl; said inner copolymer portion containing a higher percentage of said comonomer than the outer copolymer portion; the total comonomer content present in the particle, the amount of comonomer present in the copolymer of each portion, and the amount of each portion within such particles being sufficient to produce on AWG 22 wire a sintered coating having no more than 5 flaws per 100 meters of coated wire when said particles are paste extruded at a reduction ratio of 2840:1, the flaws being detected by subjecting the sintered coated wire to a high voltage spark tester at 2 KV and 300 Hz; the copolymers of the inner portion and the outer portion combined containing an amount of comonomer which is low enough to maintain the non-*melt-*fabricable nature of the polymer particles.*

Re. 31,908

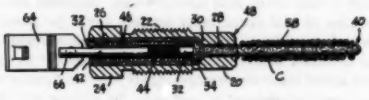
GLOW PLUG

John T. Petrik, Newtown, and Brooke N. Westover, Stratford, both of Conn., assignors to Sun Chemical Corporation, New York, N.Y.

Original No. 4,414,463, dated Nov. 8, 1983, Ser. No. 303,004, Sep. 17, 1981. Application for reissue Feb. 13, 1984, Ser. No. 579,441

Int. Cl.[3] **F23Q** *7/10*

U.S. Cl. 219—270 **12 Claims**



1. A diesel glow-plug ignitor comprising, in combination:

(a) a tubular metal body having an inner end securely carried in a cylinder opening of an engine,

(b) an electrically conductive core pin insulatedly carried in the bore of the body, physically structurally united therewith, and having a portion projecting from said inner end thereof, said projecting portion of said core pin being coated with insulating material, and

(c) a tight-wound helical igniting coil of resistance wire on said projecting portion of the core pin, having its ends respectively welded to the body and welded substantially to the end of said projecting portion of the pin,

(d) the convolutions of said coil having an insulating oxide coating thereon to prevent them from short-circuiting each other,

(e) said insulating material on the core pin having ceramic-containing insulation and being plasma sprayed thereon to further prevent the convolutions of the coil from electrically contacting the projecting portion of the core pin.

PLANT PATENTS

GRANTED JUNE 4, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,482
ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Nov. 30, 1983, Ser. No. 556,267
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by bright lemon yellow and currant red flowers of good exhibition form and medium to heavy petalage with petals reflexing upon opening displaying red toned outer petal edges and apices and retaining good exhibition form until open.

5,483
ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Nov. 30, 1983, Ser. No. 556,266
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by capsicum red buds which open quickly into bright orange red flowers with irregular yellow flower centers in the fully open stage.

5,484
ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Nov. 30, 1983, Ser. No. 556,268
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by bright red buds which upon opening reveal bicolored petals of red and Naples yellow toward point of petal attachment and display yellow centers amid red colored petals at full open bloom, flowers are very long lasting on the plant and after cutting.

5,485
PECAN TREE (JUBILEE)

Melvin B. Clemons, Rte. 1, Box 1315, Foley, Ala. 36535

Filed Nov. 15, 1983, Ser. No. 551,937
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—31 1 Claim

1. A new and distinct variety of pecan tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of medium-early maturity of high quality, large nuts on an annual basis, without the use of fungicide in an area where most pecan varieties are severely affected by pecan scab disease, said nuts having medium-thin shells which separate easily from the kernel, and a self-fertile habit which assures good annual nut crops even in the absence of any neighboring pecan trees.

5,486
PLUM TREE '42-GA-1200'

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Jun. 30, 1983, Ser. No. 509,872
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree, substantially as illustrated and described, characerized by large, clingstone, nearly globose fruit slightly flattened at the base and apex, the fruit having bluish-red skin and firm, yellow flesh; and further characterized by blooming with the Santa Rosa but bearing fruit ripening approximately one week earlier; the fruit having a good flavor and very good storage, shipping, and eating qualities; and, throughout the tree, the fruit being nearly uniform in size and relatively uniform in maturity.

5,487
PLUM TREE, SUPLUMFIFTEEN

John H. Weinberger, Fresno, Calif., assignor to Superior Farming Company, Bakersfield, Calif.

Filed Nov. 25, 1983, Ser. No. 555,191
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree substantially as illustrated and described, characterized particularly as to novelty by its general similarity to the Simka Plum Tree (U.S. Plant Pat. No. 1,882) in its regular and productive bearing of large, dark purplish skinned fruit having firm, pale yellow flesh, but differing therefrom in the greater size of its fruit, the ripening of its fruit about three weeks later than that of the Simka, and its flesh which clings over the entire surface of the stone.

PATENTS

GRANTED JUN. 4, 1985

ERRATA

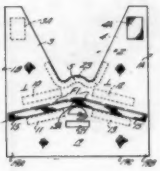
For CLASS	See PATENT NO.
406–086	4,521,130
416–175	4,521,154
357–081	4,521,170
530–501	4,521,336
534–560	4,521,337
514–021	4,521,409
514–026	4,521,410
514–203	4,521,413
514–229	4,521,414
514–252	4,521,415
514–252	4,521,416
514–255	4,521,417
514–272	4,521,418
514–267	4,521,419
514–259	4,521,420
514–267	4,521,421
514–258	4,521,422
514–290	4,521,423
514–314	4,521,424
514–350	4,521,425
514–346	4,521,426
514–354	4,521,427
514–277	4,521,428
514–383	4,521,429
514–211	4,521,430
514–471	4,521,431
514–556	4,521,432
514–315	4,521,619
514–122	4,521,646

PATENTS

GRANTED JUNE 4, 1985

GENERAL AND MECHANICAL

4,520,509
MASK WITH REMOVABLE COUNTERCURRENT EXCHANGE MODULE
Russell G. Ward, 2050 SW. 71st Ave., Portland, Oreg. 97225
Filed Feb. 18, 1983, Ser. No. 467,914
Int. Cl.³ A42B *1/18*
U.S. Cl. 2—206 **7 Claims**

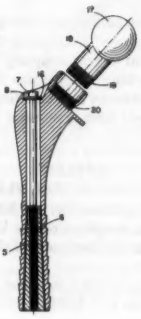


1. A face mask for protecting the wearer from hazardous environmental conditions such as cold temperatures or airborne particles, said mask comprising,
a filter body of three dimensional shape,
a fabric sheet which may be configured to define an open area within which said filter body is at least partially inset, means on said sheet for securing same to a wearer's face,
closure strips on said fabric sheet to retain same in a desired configuration to define said open area, and
attachment means in place on said sheet and about the perimeter of said filter body whereby the filter body may be retained in place within said open area in a removable manner.

4,520,510
CONVERTIBLE HEADBAND CONSTRUCTION
Ronald H. Daigle, Cranston, R.I., assignor to Wilbert Rosenberg, a part interest
Filed Dec. 5, 1983, Ser. No. 558,576
Int. Cl.³ A61F *9/02*
U.S. Cl. 2—452 **10 Claims**

1. A convertible headband construction comprising:
a. an elongated flexible band receivable in snugly encircling relation on the head of a wearer, said band having an eye opening therethrough;
b. a flexible flap on said band, said flap being alternately positionable in a first position thereof wherein it is received in encircling relation around said band for covering said eye opening and wherein said flap and said band cooperate to define a strap-like headband, and a second position thereof wherein said flap is disposed adjacent said band but said eye opening is unobstructed, and wherein said band is receivable on said head so that said eye opening is aligned with an eye of said wearer;
c. means for detachably retaining said flap in said first position thereof; and
d. means for alternatively detachably retaining said flap in said second position thereof.

4,520,511
HIP PROSTHESIS WITH EXPANDING FEMORAL COMPONENT
Paribelli Gianezio, Via Branzanti 2, and Godoli Nunzio, Via Boccaccini, both of Ravenna, Italy
Filed Jul. 30, 1982, Ser. No. 403,419
Int. Cl.³ A61F *1/24*
U.S. Cl. 3—1.913 **14 Claims**

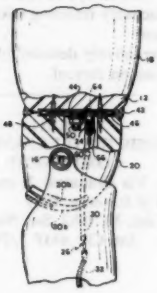


1. A hip prosthesis comprising:
an elongated member adapted for insertion in the femoral canal against the inner surface of the large femoral trocanter having a longitudinal bore and a slanted upper end terminating in an articulation;
said upper end being formed with a retaining collar adapted to rest against the median counterfort of the femur;
the lower end of the member having a plurality of longitudinal slits defining a plurality of expansible, resilient, unitary, straight, sectors adapted to grip the inner surface of the femoral trocanther;
a longitudinal, internally threaded rod with said bore; and,
actuating means in said rod for expanding said sectors after insertion of the prosthesis in said femoral canal;
said sectors having spaced outwardly extending, peripheral shoulders for locking said prosthesis in place.

4,520,512
ARTIFICIAL LIMB WITH AUTOMATIC RELEASE FOR FREE ROTATION
Hans R. Lehneis, Roslyn, and Robert G. Wilson, New York, both of N.Y., assignors to New York University, New York, N.Y.
Filed Sep. 8, 1981, Ser. No. 300,256
Int. Cl.³ A61F *1/04*
U.S. Cl. 3—22 **17 Claims**

1. In an artificial limb of the type having a joint and incorporating a rotator unit for achieving rotation about an axis ex-

tending along the limb, said rotator unit being disposed in the vicinity of said joint and including a locking mechanism movable to enable and disable the rotation of said rotator unit, the improvement comprising a coupling mechanism connecting said locking mechanism to a fixed point on said limb, said rotating unit and fixed point being on opposite sides of said



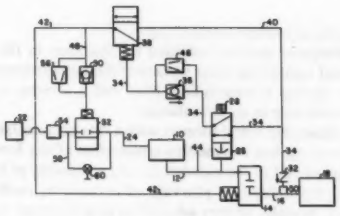
joint, said coupling mechanism extending along said limb and across said joint, and means for coupling the pivotal movement of said limb at said joint to said coupling mechanism to impart movement to said locking mechanism for enabling and disabling said rotation, whereby said enabling and disabling occur automatically when said limb is pivoted at said joint.

4,520,513

AUTOMATIC VACUUM URINAL FLUSH MECHANISM

Milton W. Raupuk, Jr., Annapolis, and Edward M. Pennington, Chester, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 2, 1983, Ser. No. 500,509
Int. Cl.³ E03D *13/00*
U.S. Cl. 4—302 **8 Claims**



1. In a vacuum sewage flow system of the type characterized by a manual flushometer that admits water into a urinal, a pressure sensing device that responds to the increased hydrostatic pressure resulting from the flush water, a vacuum switch that opens in response to the pressure sensing device, a discharge timing controller activated by and connected to system vacuum through said vacuum switch and through a check valve and orifice device, and a main discharge valve activated by and connected to system vacuum through said discharge timing controller such that the opening of the main discharge valve permits flow from the urinal which drops the hydrostatic pressure, resets both the pressure sensing device and vacuum switch and admits atmospheric pressure through the said orifice to the timing controller and main discharge valve to reset the system to its original status the improvement comprises:

a vacuum controlled water dispensing valve;

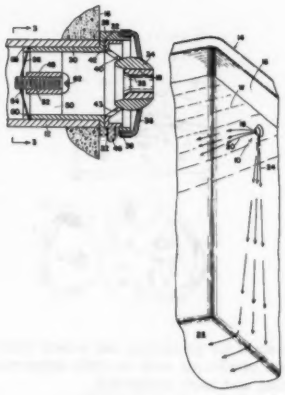
an additional vacuum line connecting the discharge timing controller to the vacuum controlled water dispensing valve so that flush water is introduced into the urinal in response to the activation of the pressure sensing switch.

4,520,514

FITTING FOR A SWIMMING POOL RETURN LINE

Bruce R. Johnson, Petaluma, Calif., assignor to Jandy Industries, San Rafael, Calif.

Filed Apr. 29, 1983, Ser. No. 490,119
Int. Cl.³ E04H *3/18*
U.S. Cl. 4—490 **4 Claims**



1. A fitting for a swimming pool return line having an outlet end near the surface of the pool comprising:

a generally cylindrical housing;

a cylindrical extension on one end of said housing receivable in the outlet end of said return line to be secured therein;

an end closure on said other end of said housing;

a nozzle centrally located on said end closure, and

a flow passageway through said nozzle to direct a jet of water outward;

said nozzle being movable in said end closure for directional adjustment of said flow passageway;

an arcuate slot in the lower portion of said housing to jet a sheet of water downward along a wall in which said housing is mounted; and

an arcuate closure member movable in said housing between a closed position wherein said slot is covered and a full open position wherein flow through said slot is unimpeded.

4,520,515

THREE POINT CLAMPING MEANS FOR A SHOWER BENCH

John Hatala, Clifton, N.J., assignor to Temco Home Health Care Products, Inc., N.J.

Continuation-in-part of Ser. No. 477,158, Mar. 21, 1983, Pat. No. 4,475,256. This application Jan. 9, 1984, Ser. No. 569,507
Int. Cl.³ A47K *3/022, 3/12;* A61H *33/02*
U.S. Cl. 4—579 **8 Claims**

1. A shower bench apparatus for use in a bathtub having an edge, said apparatus comprising:

at least two feet locatable inside of said bathtub;

a first and a second rail attached to said feet;

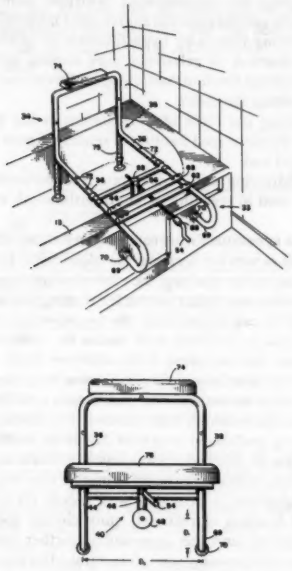
a chair unit attachable to said rails; and,

a clamping means for attaching one end of said bench to the edge of said bathtub, said clamping means including:

a stationary portion attached to said first and second rails and locatable outside of said bathtub;

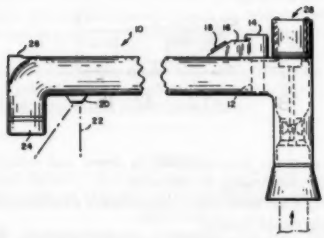
a slidable member also attached to said first and second rails and locatable within said bathtub; and,

a hand operable means for driving said slidable member along said first and second rails,



wherein rotation of said hand operable means causes said slidable member to engage the inside portion of said bathtub edge thereby clamping said bench to said bathtub.

4,520,516
ULTRASONIC FLOW-CONTROL SYSTEM
Natan E. Parsons, 86 Henry St., Cambridge, Mass. 02139
Filed Sep. 23, 1983, Ser. No. 535,213
Int. Cl.³ E03C *1/05*
U.S. Cl. 4—623 **13 Claims**



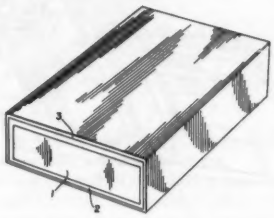
5. A flow-control system comprising:

A. a faucet, having an inlet and an outlet and providing a fluid path between the inlet and the outlet, for receiving liquid at its inlet and directing the liquid out through its outlet;

B. an electrically operable valve interposed in the fluid path and operable, by application of control signals thereto, between an open position, in which it permits fluid flow in the fluid path, and a closed position, in which it prevents fluid flow therein; and

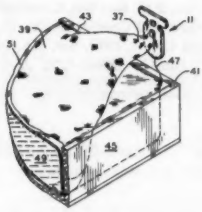
C. a detection circuit electrically connected for application of control signals to the electrically operated valve, the detection circuit including means for detecting moving objects and means for, in at least one mode of operation, operating the valve to permit liquid flow if the detecting means detects a moving object and for operating the valve to prevent fluid flow if the detecting means does not detect a moving object.

4,520,517
MATTRESS OR PILLOW CONSTRUCTION
Lars Ahlm, Ulricehamn, Sweden, assignor to Timmele Laminering AB, Ulricehamn, Sweden
Filed Jun. 24, 1982, Ser. No. 391,689
Claims priority, application Sweden, Sep. 21, 1981, 8105554
Int. Cl.³ A47C *27/15*
U.S. Cl. 5—481 **2 Claims**



1. A mattress, pillow, or the like, having a core formed of an elastic plastic material having a predominant portion of open cells, a thin layer of soft elastic plastic polyester material having predominately open cells and a short curing time said plastic thin layer completely covering said core and being permanently joined to said core by means of heat-lamination and necessitating minimum solidification time, a polyurethane plastic film which is easy to disinfect and clean, entirely covering and permanently fixed by heat-lamination to said thin layer of soft elastic plastic.

4,520,518
BED SHEET INSTALLATION AND RETENTION
Brian K. Reaser, 600 E, Road 880S, Bluffton, Ind. 46714
Filed Sep. 30, 1983, Ser. No. 537,703
Int. Cl.³ A44B *21/00*
U.S. Cl. 5—498 **6 Claims**



1. A bed-cover retainer for holding an edge portion of a bed-cover in position beneath an edge of a bed mattress comprising a semi-rigid generally flat anchor having an elongated stem portion with a handle portion near one end of the stem portion, and a bed-cover gripper permanently fastened to the anchor for selectively fastening a section of the bed-cover near an edge thereof to the anchor whereby the bed-cover may be fastened to the anchor and then the anchor slid downwardly along the side and then under the mattress to lie generally flat beneath the mattress and retained by the weight thereof to hold

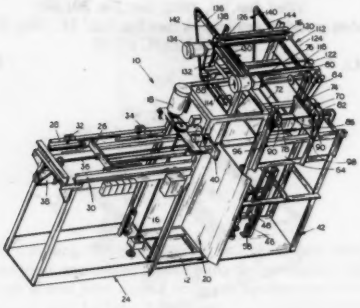
the bed-cover in position tucked about the mattress, the handle portion comprising a pair of oppositely extending lateral tabs.

4,520,519

APPARATUS FOR REMOVING HONEY FRAMES FROM SUPERS

Lawrence J. Kuehl, Loup City, Nebr. 68853

Filed Sep. 12, 1983, Ser. No. 530,955
Int. Cl.³ A01K *51/00*
U.S. Cl. 6—12 R **4 Claims**



1. An apparatus for removing the frames from honey supers, comprising:

a frame means,

a first support means on said frame means adapted to receive a stack of honey supers thereon,

first means for horizontally laterally moving the uppermost super from the stack to a first holding area on said frame means,

second means on said frame means for vertically removing the frames from the super which is held in said first holding area,

conveyor means on said frame means for moving the removed frames to a second holding area on said frame means for subsequent removal from the frame means,

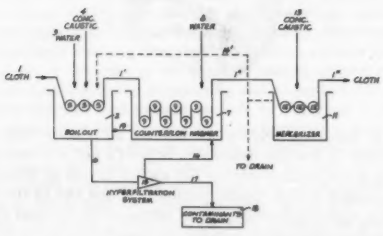
said first means comprising a horizontally movable push arm which engages the uppermost super and pushes the same laterally to said first holding area.

4,520,520

MERCERIZATION PROCESS AND APPARATUS

Lawton L. Johnston, P.O. Box 104, Graniteville, S.C. 29827, and Craig A. Brandon, 103 Crestwood Dr., Clemson, S.C. 29631

Filed Feb. 1, 1983, Ser. No. 462,909
Int. Cl.³ D06B *7/08, 23/20*
U.S. Cl. 8—151 **19 Claims**



1. In a process for mercerizing of cellulosic cloth comprising treating the cloth with 3–10% caustic at the boil in a boilout stage, washing the cloth after treatment in the boilout stage and treating the washed cloth with 20–25% caustic in a mercerizer, the improvement comprising the steps of:

(a) collecting overflow from the boilout stage, contaminated with additives used in weaving and knitting the cloth;

(b) treating the contaminated overflow from the boilout stage by prefiltration to remove solid material and treating a resulting filtrate by hyperfiltration to produce a recovered fraction of relatively pure caustic solution and a concentrate fraction containing additives used in weaving or knitting the cloth;

(c) washing the cloth after treatment in the boilout stage with the recovered fraction of relatively pure caustic from step (b) and

(d) withdrawing said concentrate fraction containing additives used in weaving or knitting the cloth from the system.

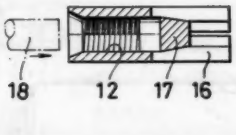
12. In an apparatus for mercerizing cellulosic cloth comprising boilout means for treating the cloth with 3–10% caustic solution, means for washing the cloth downstream of the boilout means and mercerizer means for treating the washed cloth with 20–25% caustic solution, the improvement wherein the boilout means is provided with means for collection of overflow liquor, contaminated with additives from weaving or knitting; the overflow collection mens is provided with a hyperfiltration means, downstream from a perfilter means for removing solid materials from the overflow liquor, for treating the resulting prefiltered overflow liquor to produce a recovered fraction of relatively pure caustic solution and a concentrate fraction, containing additives used in weaving or knitting; and the apparatus is provided with means for recycling the recovered fraction of relatively pure caustic solution to the washing means; and the apparatus is further provided with means for withdrawing said concentrate fraction, containing additives used in weaving and knitting.

4,520,521

PROCESS OF MANUFACTURING A SLEEVE AND WEDGE FOR AN ANCHOR BOLT

Akira Miyake, 5-2, Imagawa 2-chome, Higashi, Sumiyoshi-ku, Osaka-shi, Osaka, Japan

Filed Mar. 8, 1983, Ser. No. 473,341
Claims priority, application Japan, Dec. 2, 1982, 57-212312
Int. Cl.³ B21K *1/44;* B21D *31/00*
U.S. Cl. 10—27 PH **7 Claims**



1. A process for manufacturing a sleeve and wedge for an anchor bolt, comprising the steps of:

(1) cutting a bar stock into longitudinally extending pieces of predetermined length;

(2) forming a longitudinally extending bolt hole having a cross-sectional area, at one end of each piece, the bolt hole terminating at an end surface having an area equal to the cross-sectional area of the bolt hole, inside the piece;

(3) forming slits in each piece longitudinally extending from the end of each piece opposite the one end to about the midpoint of the longitudinal extend of the piece; and

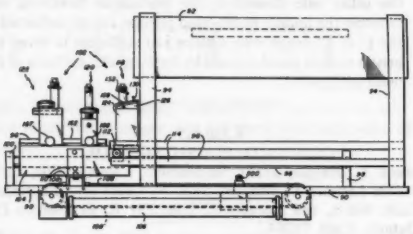
(4) longitudinally striking the other end of each piece only over a striking area less than the area of the end surface of the bolt hole so as to shear a wedge from each piece, the wedge having opposite end surfaces defined by the end surface of the bolt hole and said striking area, without removing the wedge from inside the piece.

4,520,522

TECHNIQUES FOR STIFFENING SHOE INSOLES

Jules N. Allard, Tyngsboro, Mass., assignor to Bush Universal, Inc., Woburn, Mass.

Division of Ser. No. 236,569, Feb. 20, 1981, Pat. No. 4,430,767.
This application Sep. 19, 1983, Ser. No. 533,226
Int. Cl.³ A43D *31/00*; A43B *13/41*
U.S. Cl. 12—40.5 **12 Claims**



1. An apparatus for stiffening an insole with an externally activatable, flexible shank strip comprising:

means for supporting the insole to confine the insole to a predetermined longitudinal curve;

said insole supporting means being adapted to support the insole at three points including the heel, ball and arch, each of said supporting points being preselected for a particular insole configuration and defining a predetermined datum point for the respective portions of the insole whereby plurality of insoles successively placed on the supporting means each will by confined to the identical predetermined longitudinal configurations;

said supporting means further comprising a heel support unit, an arch support unit and a ball support unit, the heel support unit being located in a predetermined location, each of the ball and arch support units being movable longitudinally with respect to the heel support unit and with respect to each other;

gauge means associated with the heel support unit to provide a fixed datum for the longitudinal placement of the heel of the insole;

hold-down means movable toward and away from the insole supporting means to press the insole firmly into engagement with the insole supporting means;

said hold-down means being further constructed and arranged to retain the flexible shank strip in an uncured state on the insole and in a position conforming to the shape of the insole; and

means for activating the shank strip while retaining the insole in said predetermined configuration and while maintaining the shank strip insert conforming shape.

4,520,523

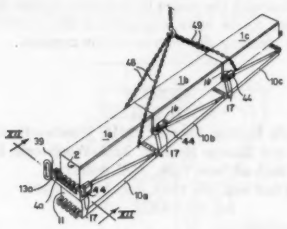
BRIDGE MODULE FOR USE IN A CRANE ASSISTED METHOD OF BUILDING A TRANSPORTABLE GIRDER BRIDGE

James P. Fitzgerald-Smith, Ossemsley, Nr. New Milton; Bertram Bird, Bournemouth, and Michael Willis, Ryde, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Great Britain

Filed Oct. 5, 1982, Ser. No. 432,828
Claims priority, application United Kingdom, Oct. 5, 1981, 8130029
Int. Cl.³ E01D *15/12, 21/04*
U.S. Cl. 14—2.4 **4 Claims**

1. A crane-assisted method for interconnecting a second bridge module to an identical first bridge module, said first and second modules each including upper and lower girder sections, said method including the steps of:

a. supporting the second module in a substantially horizontal attitude by means of two pairs of slinging chains symmetrically attached to the upper girder section, the second module being positioned so as to interdigitate tongues of exposed upper and lower first end faces respectively provided on the upper and lower girder sections of the second module with corresponding tongues of exposed second end faces respectively provided on the upper and lower girder sections of the first adjoining module,



b. pinning the lower interdigitated tongues of the lower girder section with a first assembly pin;

c. disconnecting one pair of the slinging chains nearest to a stub pin and relieving the cantilever effect of the second module at the stub pin by upwardly rotating the second module about the first assembly pin by means of the other pair of slinging chains until the stub pin can be freely withdrawn and replaced by a second assembly pin; and

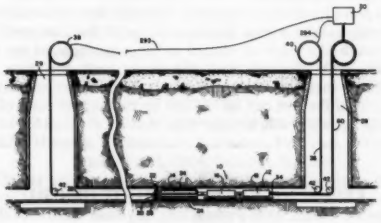
d. disconnecting the other pair of slinging chains.

4,520,524

REMOTELY CONTROLLED HYDRAULIC CLEANER APPARATUS

Charles A. Long, Jr., 4144 Sharpsburg Dr., Birmingham, Ala. 35213

Filed Mar. 26, 1984, Ser. No. 593,453
Int. Cl.³ B08B *9/02*
U.S. Cl. 15—104.3 R **18 Claims**



1. A remotely controlled, hydraulically operated cleaner apparatus for use in cleaning the interior of a conduit comprising:

control means located outside of the conduit for generating control signals for controlling the operation of the cleaner apparatus;

a source of pressurized hydraulic fluid;

valve means for receiving both pressurized hydraulic fluid from the fluid source and control signals from the control means and for distributing the received hydraulic fluid in accordance with the received control signals;

a housing;

a hydraulically powered motor within the housing, said motor receiving hydraulic fluid from the valve means for operation thereof;

adjustable cleaner tool means cooperating with the motor

for rotation relative to the conduit upon operation of the motor, said cleaner tool means being adjustable to maintain engagement with the interior walls of the conduit;

adjustable support means for supporting the housing within the conduit;

hydraulically actuated means for receiving hydraulic fluid from the valve means, said hydraulically actuated means including means for adjusting the adjustable support means to maintain the housing generally radially centered within the conduit whereby the housing is moved along the conduit with the motor in operation so that the cleaner tool means rotate while engaging in the interior conduit walls for cleaning the interior of the conduit.

4,520,525

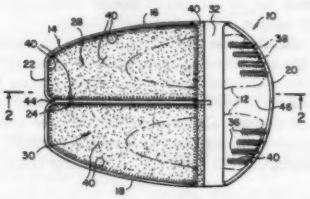
FOOT BRUSH

Seigi Yogi, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Sep. 26, 1983, Ser. No. 536,166

Int. Cl.³ A47K *3/022*

U.S. Cl. 15—104.92 **5 Claims**



1. An apparatus for brushing and bathing feet which comprises:

(a) an oblong receptacle having two side walls, a front wall a rear wall, a center wall and a floor that forms two compartments for the feet;

(b) a bridge member affixed across the top of the two side walls near the front wall of the receptacle to engage insteps of the feet;

(c) a plurality of short wall members affixed transverse to the front wall to engage inbetween toes of the feet; and

(d) brush-like material affixed to inner surfaces of the two side walls, the rear wall, the center wall, the floor, the bridge member and the short wall members so that all parts of the feet can be cleaned by rubbing all parts of the feet against the brush-like material.

4,520,526

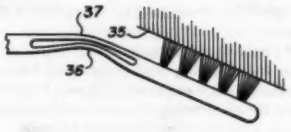
RESILIENTLY FLEXIBLE TOOTHBRUSH

Charles W. Peters, 1498 Padres Dr., San Jose, Calif. 95125

Filed Jun. 22, 1984, Ser. No. 623,107

Int. Cl.³ A46B *9/04*

U.S. Cl. 15—167 R **3 Claims**



1. A tooth brush comprising:

a shaped body member having a handle portion, a head portion and a resiliently flexible portion therebetween, the head portion having attached bristles, the resiliently flexible portion being flexible in a vertical plane allowing the head portion movement relative to the handle portion, but substantially rigid in a horizontal plane, the bristles extending upwardly in the vertical direction, wherein said body member has a shaped hollow at the resiliently flexible portion, creating a thin top resiliently flexible horizontal member and a thin bottom resiliently flexible horizontal member, said shaped hollow extending completely through said resiliently flexible portion from one side to the other side thereof in the horizontal direction, and wherein the middle of the head portion can be deflected in the $\frac{1}{4}$" to $\frac{3}{4}$" range with a force just sufficient to bring the bristle ends in good contact to the irregular surfaces of the teeth and gums.

4,520,527

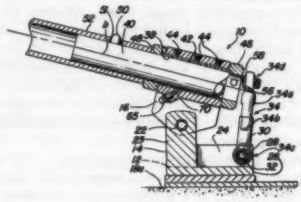
CONCRETE FINISHING TOOL

Richard A. Maggio, 27191 Shenandoah, Laguna Hills, Calif. 92653; Leonard C. Maggio, 1520 N. Carol Dr., La Habra, Calif. 90631, and Norman L. Hill, 731 E. El Morado Ct., Ontario, Calif. 91764

Filed Jul. 15, 1983, Ser. No. 514,237

Int. Cl.³ E01C *19/44*

U.S. Cl. 15—235.8 **14 Claims**



1. A tilting bracket tool adapted for connection to a smoothing plate, comprising:

a base plate;

a yoke pivotably mounted to the base plate, said yoke having means defining a passageway therein, which passageway has an axis that is disposed generally at a right angle to the axis about which the yoke pivots;

handle receiving means extending through the passageway with the forward end thereof extending beyond the yoke pivot axis, which handle receiving means is adapted to rotate while being retained in the passageway; and

a rod having one ball and socket end universally and operably secured to the forwardly located end of said handle receiving means and another ball and socket end universally and operatively secured to the base plate at a location forward of the base plate pivot axis to allow the end of the rod connected to the handle receiving means to follow the movement of the handle means as it rotates and to allow the other end connected to the base plate to pivot about a point so that the longitudinal axis of the rod inscribes a cone as it moves during rotation of the handle receiving means, thereby tilting the base plate.

4,520,528

VACUUM FOAM REMOVER

Geza J. Grof, Fremont, Calif., assignor to James Dole Corporation, Redwood City, Calif.

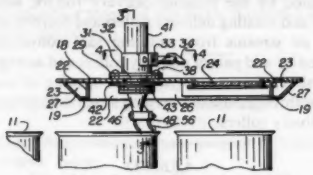
Filed Jul. 27, 1983, Ser. No. 517,581

Int. Cl.³ B67C *1/00*; B08B *5/04*

U.S. Cl. 15—304 **11 Claims**

1. A vacuum foam remover comprising a nozzle extending across the path of containers as they move between filling and closing stations, support means supporting said nozzle above

said path, vacuum means for drawing a vacuum through said nozzle, and a substantially rectangular frame at the bottom of said nozzle extending across said path, first and second parallel



sides of said frame being substantially transverse to said path and substantially longer than the third and fourth sides of said frame.

4,520,529

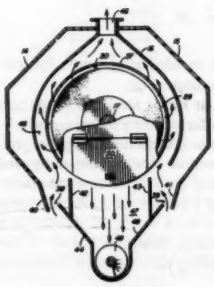
SEED DELINTER

Boyce W. Davis, 3902 E. Bronco Trail, Phoenix, Ariz. 85044

Filed Aug. 24, 1983, Ser. No. 525,937

Int. Cl.³ D01B *1/04*

U.S. Cl. 19—41 **9 Claims**



1. An apparatus for delinting cottonseed comprising:

a generally cylindrical wire mesh drum means,

an abrasive rotor disposed within said drum means whereby an annular space is provided between said rotor and the interior of said drum means,

means for rotating said drum means and said rotor relative to each other in the same direction,

said drum means rotating at a slower speed than said rotor,

an inlet whereby cottonseed is introduced into said annular space,

at least one cottonseed outlet from said annular space,

a lint collection hood formed partially around and along the length of said drum means for receiving lint dislodged from the cottonseed in said annular space and forced through said drum means upon the relative rotation of said drum means and said rotor, and

means for causing a stream of air drawn into said apparatus to pass through said annular space and out of said apparatus.

4,520,530

FIBER FEEDING APPARATUS WITH A PIVOTED AIR EXHAUST WALL PORTION

Akiva Pinto, 525 Eastwood Dr., Gastonia, N.C. 28054

Filed Sep. 2, 1983, Ser. No. 528,973

Int. Cl.³ D01G *15/40*

U.S. Cl. 19—105 **5 Claims**

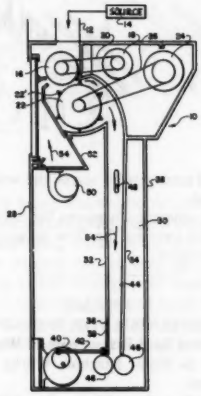
1. Apparatus for feeding fibers to textile processing equipment such as carding machines and the like, said apparatus including:

(a) a fiber collecting chute formed by generally stationary, imperforate walls extending in a vertical direction;

(b) means for delivering fibers into the upper end of said chute for collection therein;

(c) means for causing a flow of air downwardly through said collected fibers in said chute to compact said collected fibers;

(d) means for discharging said collected and compacted fibers from the lower end of said chute;



(e) a generally vertically extending perforated wall portion disposed along at least a portion of the vertical extent of said chute to permit said flow of air to be discharged therethrough, said perforated wall portion being mounted for alternating pivotal movement about a generally horizontal axis disposed intermediate the vertical extent of said perforated wall portion so that said pivotal movements thereof cause the upper and lower ends of said perforated plate to be alternately and periodically abutted against and separated from the fibers compacted adjacent thereto to release said fibers, and

(f) drive means for causing said pivotal movements about said horizontal axis.

4,520,531

APPARATUS FOR MAKING A WEB FROM FIBERS

Hubert Hergeth, Kockerellstr. 3, Aachen, Fed. Rep. of Germany

Filed May 2, 1984, Ser. No. 606,349

Claims priority, application Fed. Rep. of Germany, May 2, 1983, 3315909; Aug. 5, 1983, 3328358

Int. Cl.³ D01G *15/40*

U.S. Cl. 19—105 **14 Claims**

1. An apparatus for making a web of fibers, the apparatus comprising:

an upright and horizontally elongated supply duct having an upper end, an open lower end, and a foraminous side wall;

means for feeding fibers to the upper end of the supply duct, whereby the fibers descend in this duct as a ribbon-shaped web;

an upright and horizontally elongated forming duct having an upper end receiving the fiber web from the supply duct, a lower end, and a foraminous side wall;

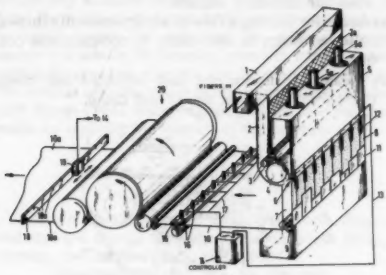
means for flowing gas down in the ducts and through the foraminous side walls thereof for shaping the web and advancing it to the respective lower ends;

means at the lower end of the forming duct for withdrawing the web therefrom;

means for measuring the thickness of the web at a plurality

of sensing locations spaced transversely along the web downstream of the lower end of the forming duct;

respective individually operable flow-adjusting means for varying the gas flow in one of the ducts at respective



zones spaced transversely across the web like the sensing locations; and

control means connected between the detecting and adjusting means for varying the flow in accordance with the detected thickness.

4,520,532

DRAFTING MECHANISM FOR SPINNING MACHINES

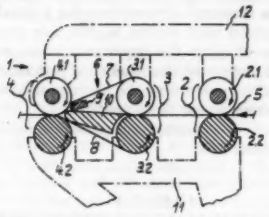
Herbert Stalder, and Emil Briner, both of Winterthur, Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Sep. 28, 1983, Ser. No. 536,653

Claims priority, application Switzerland, Oct. 11, 1982, 5945/82

Int. Cl.³ D01H *1/22*

U.S. Cl. 19—244 **5 Claims**



1. A drafting mechanism for spinning machines for drafting fiber slivers, in particular for jet spinning machines comprising:

a pair of rollers;

a respective apron provided for each of the rollers of said pair of rollers for guiding a fiber sliver between said aprons;

said aprons defining an apron pair having an exit opening;

at least one pair of delivery rollers arranged downstream of said pair of rollers provided with said aprons, viewed with respect to a predetermined direction of movement of the fiber sliver;

said exit opening of the pair of aprons being arranged in relation to a nip line of the pair of delivery rollers such that the fiber sliver undergoes at least one diversion at a region between said exit opening and said nip line;

said pair of delivery rollers defining a converging space;

one of said two aprons projecting into said converging space of said pair of delivery rollers;

said fiber sliver being diverted about said one of the two aprons which projects into said converging space of the pair of delivery rollers; and

both aprons being guided close to the pair of delivery rollers such that said aprons do not contact said pair of delivery rollers and an air gap between the aprons and said pair of delivery rollers essentially is as small as possible in order to divert circumferentially directed air streams which are entrained by the rotating delivery rollers, substantially along said rotating delivery rollers and thereby preventing such air streams from entering said converging space defined by said pair of delivery rollers and acting upon the fiber sliver drawn from said exit opening of said pair of aprons through said converging space defined by said pair of delivery rollers.

4,520,533

STRAP GUIDE FOR STRAP ADJUSTMENT ASSEMBLY

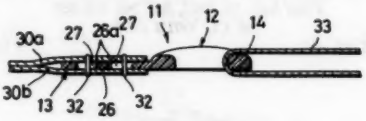
Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1983, Ser. No. 522,401

Claims priority, application Japan, Aug. 12, 1982, 57-122728[U]

Int. Cl.³ A44B *11/00*

U.S. Cl. 24—198 **11 Claims**



1. A one-piece molded strap guide for use in a strap-adjustment assembly, comprising:

(a) a rectangular frame having a single central strap-receiving rectangular opening therein; and

(b) a rectangular attachment wing integral with one side of said frame remote from said opening, and having a length corresponding to that of said opening, said rectangular wing having a pattern of uniformly spaced parallel openings defined by a series of uniformly spaced ribs, said spaced openings being receptive of sewing stitches by which said wing may be sewn to the assembly.

4,520,534

SLIDING CLOSURE ASSEMBLIES

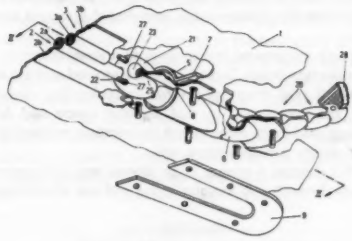
Eduardo De Lima Castro Netto, Rua Sao Luiz Gonzaga No. 912, Rio de Janeiro, Brazil

Filed Jan. 4, 1983, Ser. No. 455,623

Claims priority, application Brazil, Jan. 22, 1982, 8200339

Int. Cl.³ A44B *17/00*

U.S. Cl. 24—399 **14 Claims**



1. A sliding closure device of an opening in a bag or the like, characterized by including two track parts which extend along opposite sides of the opening, each said track part comprising a rail and a fixing portion for attaching the rail to the bag fabric, an elongate closure element comprising a plurality of substantially identical articulatedly joined segments which have a total length substantially equal to the length of the

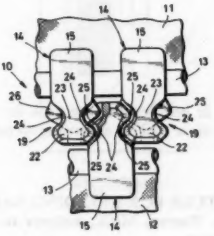
opening, each segment having at least one passageway extending in the longitudinal direction of the closure element and an open slot communicating with each passageway along its length, the rails each being slidingly receivable in a respective passageway, each said fixing portion being joined to the bag fabric and extending from the bag fabric through a said slot to its respective rail portion.

4,520,535

SLIDE FASTENER HAVING DISCRETE COUPLING ELEMENTS

Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 6, 1983, Ser. No. 492,142
Claims priority, application Japan, May 7, 1982, 57-66159[U]
Int. Cl.³ A44B *19/00*
U.S. Cl. 24—410 **2 Claims**



1. A slide fastener comprising:
(a) a pair of stringer tapes; and
(b) a series of uniformly spaced coupling elements carried on each of said stringer tapes, each said coupling element having a generally rectangular body which has a coupling end portion and a pair of parallel spaced apart legs extending axially rearwardly therefrom to hold a longitudinal edge portion of each of said stringer tapes therebetween, said coupling end portion projecting beyond said longitudinal edge portion at a right angle to the axis of the slide fastener, and having
(1) a first coupling portion located on one side of the plane of said stringer tapes, said first coupling portion having a rounded head and a neck integral therewith, said head and said neck being complementary in shape to each other, said neck having a pair of arcuate first sidewalls respectively defining a pair of recesses disposed symmetrically with respect to the axis of said body, and
(2) a second coupling portion located on the other side of the plane of said stringer tape, said second coupling portion having a pair of second sidewalls each having a first planar portion extending obliquely outwardly from respective opposite sides of one of said legs to a turning point beyond the width of said legs, and a second planar portion extending obliquely inwardly from said turning point to intercept one end of said first sidewalls respectively adjacent to said rounded head, thereby defining a pair of shoulders at the ends of said recesses which extend laterally in opposite directions beyond the width of said legs.

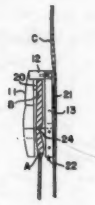
4,520,536

CLOTHING CLASP

Hiroyuki Hata, 5-8-19 Morikita-cho, Higashinada-ku, Kobe 658, Japan

Filed Jun. 8, 1983, Ser. No. 502,200
Claims priority, application Japan, Jun. 17, 1982, 57-91363[U]
Int. Cl.³ A44B *21/00*
U.S. Cl. 24—498 **9 Claims**

1. A clasp for holding articles of clothing together, comprising a front member, a back member, detachable fastening means for attaching said back member to said front member at spaced locations to define a space therebetween, said fastening means being releasable to enable said back member to be detached from said front member, and said fastening means including resilient means enabling said back member to move relative to said front member and to urge said back member toward said front member, a clamp member, pivot means connecting said back and clamp members together, said front



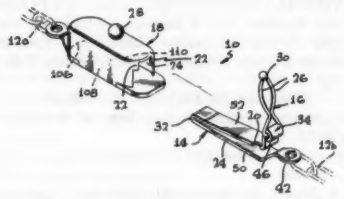
and back members being adapted to be positioned such that portions of said articles of clothing are received in said space, said clamp member being movable on said pivot means between a clamped position and an open position, said clamp member including article engagement means thereon, said engagement means extending into said space when said clamp member is in said clamped position and being out of said space when said clamp member is in said open position.

4,520,537

GOLD JEWELRY CLASP ASSEMBLY

Sioma Valikov, Van Nuys, Calif., assignor to Harry Wolf & Sons, Los Angeles, Calif.

Filed Jun. 18, 1979, Ser. No. 49,544
Int. Cl.³ A44B *19/00*
U.S. Cl. 24—616 **4 Claims**



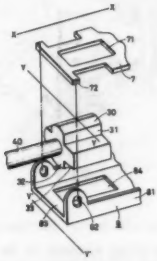
1. A gold jewelry catch assembly, comprising:
a catch; and
a retainer which includes a wire with a pivot portion pivotally held on said catch;
said catch being formed of a unitary strip of gold alloy, said strip having a middle portion which is folded over to form a folded leaf spring and said strip being of a spring temper along said middle portion, said strip having an eyelet at a first strip end and being bent into a loop at the other second end around said wire pivot portion, whereby to complete the ends of the strip without a soldering operation which could heat and anneal the leaf spring.

4,520,538

BUCKLE ASSEMBLY

Yasumasa Sano, Kanagawa, and Tetsuya Ohwada, Chiba, both of Japan, assignors to NSK-Warner K.K. and Nippon Kinzoku Co., Ltd., both of, Japan

Filed Jun. 2, 1983, Ser. No. 500,444
Claims priority, application Japan, Jun. 10, 1982, 57-86348[U]
Int. Cl.³ A44B *1/18*
U.S. Cl. 24—682 11 Claims



1. A buckle assembly comprising:

a clinched anchor block fixedly secured to a wire and provided with a first interlocking portion at an upper part and a second interlocking portion at a lower part thereof,

a buckle base having at least one bottom wall provided with a portion to be engaged with the second interlocking portion,

a support means mounted on the buckle base and adapted to engage with the first interlocking portion, and

the second interlocking portion being fixedly connected with the portion to be engaged of the buckle base, and the first interlocking portion being maintained in a non-engaged state with respect to the support means;

the clinched anchor block being normally engaged only with the buckle base and the support means movably disposed with respect to the buckle base, whereby the clinched anchor block becomes held both by the buckle base and the support means by the first interlocking portion being engaged with the support means when the wire received a tension exceeding a predetermined value.

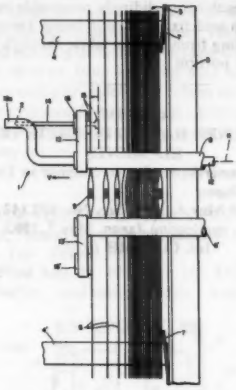
4,520,539

DEVICE FOR SEPARATING AND DELIVERING INDIVIDUAL HEDDLES TO A DRAW-IN POSITION

Heinz John, deceased, late of Berneck, Switzerland, and Friedlinde John née Rueffler, heiress, Gams, Switzerland, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 430,287
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1981, 3139625
Int. Cl.³ D03J *1/14*
U.S. Cl. 28—206 6 Claims

1. In a device for individually separating drop wires or heddles bunched into packs and mounted on heddle slide rails, using individually separating means associated with the individual packs by the intermediary of which the foremost drop wire or heddle of a pack first is lifted a discrete extent from the pack and then is moved into a position for drawing-in a warp thread, and including a pair of blow tubes displaceable parallel to the pack and rotatable about their longitudinal axes with suction nozzles arranged at bent-around ends of said blow tubes, the improvement comprising a blow nozzle (12*a*) in at least one of said blow tubes (12), said blow nozzle being located in the bent-around end of the respective blow tube (12) and directed along the direction of advance (V) of the heddle (6) or drop wire, and an oppositely directed suction nozzle (14) inserted as an ejector nozzle (2) into said blow nozzle (12*a*), whereby a blast through the respective blow tube (12) generates a suction effect at the suction nozzle (14) to lift the foremost drop wire or heddle from the pack for movement with the displaceable blow tube to a drawing-in position.

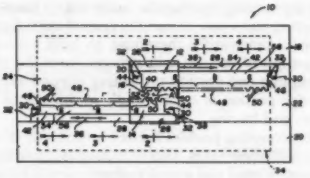


4,520,540

FIXTURE FOR GRINDING RACKS

James T. Killop, Warren, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

Division of Ser. No. 237,240, Feb. 23, 1981,. This application Mar. 25, 1983, Ser. No. 478,897
Int. Cl.³ B24B *39/00, 19/00*
U.S. Cl. 29—90 B 5 Claims



1. A fixture for holding a pair of unitary blanks during grinding of toothed faces thereon, the fixture comprising: a base having a flat lower surface and a pair of upwardly facing support surfaces that are inclined with respect to the lower surface the same angular extent as each other; and a clamp for clamping a pair of unitary blanks on the base with the mounting surfaces thereof respectively engaged with the pair of inclined support surfaces such that inclined teeth can be ground on both blanks by feeding of a rotating grinding wheel parallel to the lower surface of the base.

4,520,541

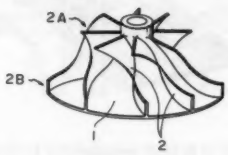
METHOD FOR PRODUCING PROFILED PRODUCT HAVING FINS

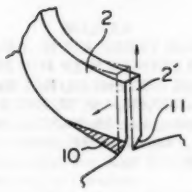
Isao Miki, and Toshiyuki Kawai, both of Shimizu, Japan, assignors to Nippon Light Metal Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,177
Claims priority, application Japan, Dec. 19, 1980, 55-178992; Apr. 13, 1981, 56-55287
Int. Cl.³ B23P *15/02*
U.S. Cl. 29—156.8 CF 10 Claims

1. Method for producing a profiled product with fins such as impellers having twisted vanes not formable directly by casting without collapsible cores, comprising the steps of first casting a preliminary shape, said shape having roots and elon-

gated fins in such a form that they can be shaped by a casting process, one side of said root of each fin being formed with a concave filled out portion varying in size or amount along the length of the fin depending upon the final configuration thereof, while a corresponding cut out portion is formed at the opposite side of said root at a position corresponding to said concave filled out portion, and applying a laterally offsetting force relative to the fin to force each fin radially outwardly





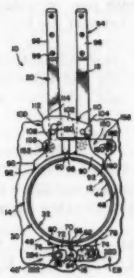
from said shape so as to cause plastic deformation at the portion of the fin where said concave filled out and corresponding cut out portions are provided to provide a lateral offsetting of the fin to the side toward the concave filled out portion thereby permitting the position of the root of each fin at said portions to be displaced toward the side provided with said concave filled out portion by an amount corresponding to the variation in the size of said concave filled out and cut out portions to form the final shape of each fin.

4,520,542

HAND OPERABLE TOOL USED IN INSTALLING PISTON ASSEMBLIES INTO AN ENGINE BLOCK

Tibor J. Villanyi, Hanahan, S.C., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Sep. 14, 1983, Ser. No. 532,149
Int. Cl.³ B23P *15/10*
U.S. Cl. 29—224 **9 Claims**



1. A hand operable tool used in manually installing a piston assembly including a piston and piston mounted piston rings in an engine block of a combustion engine comprising:

a pair of movable jaw portions adapted to move from an open piston to receive the piston assembly to a closed position to surround the piston mounted piston rings;

dowel pin receiving means on said movable jaw portions for attaching said movable jaw portions to an engine block of a combustion engine and for accurately orienting, locating and supporting said movable jaw portions with respect to an engine block cylinder bore;

at least one permanent magnet means on said movable jaw portions for attaching said movable jaw portions to an engine block in a stable manner; and

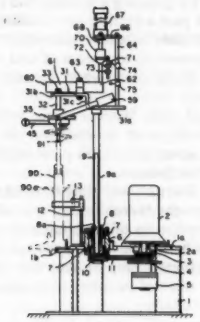
handle means for moving said movable jaw portions between said open and closed positions.

4,520,543

COIL SPRING COMPRESSOR, WITH VERTICALLY ADJUSTABLE CLAMP CARRIAGE

Yuji Ito, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 28, 1982, Ser. No. 453,839
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—227 **3 Claims**



1. An improved coil spring compressor for use in the assemblage of automotive suspension systems, said coil spring compressor being of the type in which a movable head plate is provided above a base for movement toward and away from said base to compress a coil spring mounted on a suspension strut which forms part of the suspension system to be assembled and which is secured to said base, wherein the improvement comprises:

a pair of spaced guide bars connected to and pending from said movable head plate;

a slidable clamp carriage mounted on said guide bars for sliding movement through at least a predetermined distance; and

a pair of clamping assemblies mounted on said clamp carriage opposite with one another at both sides of said coil spring, each of said clamping assemblies comprising a pair of clamping arms pivoted to the clamp carriage and provided, respectively, with a clamping finger at the inner free end thereof, one of said clamping arms being provided with an operating handle, said clamping arms being interconnected with each other so that on actuating said one arm by said handle the clamping fingers on both arms conjointly extend toward the coil spring to engage between any desired successive turns of the coil spring.

4,520,544

METHOD OF AND APPARATUS FOR AUTOMATICALLY FINISHING SLIDE FASTENERS

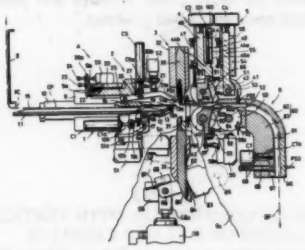
Toyoo Morita, Uozu, and Yoichi Horikawa, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,312

Claims priority, application Japan, Nov. 16, 1982, 57-173471; Dec. 7, 1982, 57-214183

Int. Cl.³ B21D *53/50*

U.S. Cl. 29—408 **8 Claims**



1. A method of automatically finishing slide fasteners, comprising the steps of:

(a) feeding an elongate slide fastener chain with a feedout mechanism by gripping a leading end of said chain along a chain path past a cutting mechanism;

(b) feeding said slide fastener chain with a first feeder mechanism (4) disposed downstream of said cutting mechanism along said chain path while inactivating said feedout mechanism;

(c) feeding said slide fastener chain with a second feeder mechanism disposed downstream of said first feeder mechanism along said chain path while inactivating said first feeder mechanism;

(d) stopping a slider on said slide fastener chain with respect to the movement thereof along said chain path to intermesh a pair of rows of coupling elements thereon while said chain is being fed by said second feeder mechanism;

(e) engaging a bottom stop on said slide fastener chain adjacent to said rows of coupling elements to stop the movement of said chain;

(f) inactivating said second feeder mechanism simultaneously with said engaging step (e); and

(g) cutting off said chain across an element-free gap adjacent to said bottom stop to produce a slide fastener.

4,520,545

METHOD FOR MANUFACTURING PINS PARTICULARLY INTENDED FOR ANCHORING IN THE GROUND POSTS OR STAKES, AND PINS OBTAINED THEREBY

Paul Moraly, 168, 170 rue Victor-Hugo, 93110 Rosny sous Bois, France

PCT No. PCT/FR83/00037, § 371 Date Oct. 19, 1983, § 102(e) Date Oct. 19, 1983, PCT Pub. No. WO83/03115, PCT Pub. Date Sep. 15, 1983

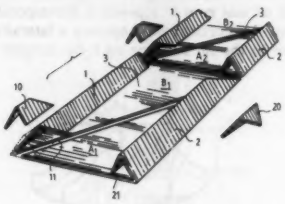
PCT Filed Mar. 1, 1983, Ser. No. 547,575

Claims priority, application France, Mar. 5, 1982, 82 03681

Int. Cl.³ B23D *17/00*; E04H *12/20*

U.S. Cl. 29—412 **16 Claims**

1. A method of making, from a strip, a peg including a prismatic sheath from at least one surface of which extends a fin shaped so as to facilitate its downward penetration into the ground and provide strength in the transverse direction, characterized in that the method comprises: shaping a strip adapted to form a plurality of pegs so as to define on each edge thereof a straight prismatic sleeve (1, 2) having all along its longitudinal dimension an opening (11, 21) extending along its edge which connects it with the intermediate strip portion (3) joining both sleeves to each other; and cutting said shaped strip both in a direction orthogonal to the generatrixes of said prismatic sleeves (1, 2) to form sections (A_1, B_1, A_2, B_2) the length of which is equal to the vertical dimension of the peg, and, in each said section, along a diagonal plane (A_1, B_1).



4,520,546

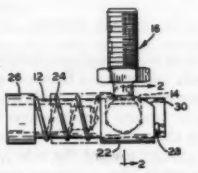
METHOD FOR FABRICATING A BALL JOINT ASSEMBLY INCLUDING A STEP FOR BURR REMOVAL

Raymond E. Darnell, 313 Elmer St., Fort Wayne, Ind. 46808

Division of Ser. No. 367,688, Apr. 12, 1982, Pat. No. 4,431,330. This application Aug. 19, 1983, Ser. No. 524,551

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—441 R **4 Claims**



1. The method of fabricating a ball joint assembly comprising the steps of providing a body of at least part cylindrical shape, drilling a cylindrical socket into said body along an axis transverse to the axis of said body and to penetrate at least a portion of the cylindrical surface of said body and to a diameter and size as forms substantially diametrically opposed feather edges on said body, providing a stud member having a ball-like swivel portion dimensioned to have a sliding fit with the side wall of said socket, said swivel portion being an integral part of said stud member, cutting away said feather edges by counterboring the outer portion of said cylindrical socket to a predetermined depth that provides a shoulder completely surrounding said socket near the outer end thereof and which penetrates said cylindrical surface of said body, said annular shoulder defining a plane substantially normal to the axis of said socket, and placing said ball-like swivel portion of said stud member within said cylindrical socket.

4,520,547

FLANGING OF PLASTIC LINED CONDUIT

Larry J. Laursen, Midland, and Elton D. Prueter, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

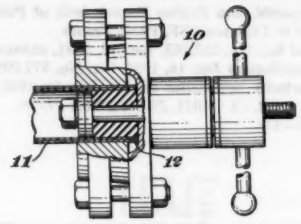
Filed Feb. 15, 1983, Ser. No. 466,452

Int. Cl.³ B21D *39/00*; B21B *17/02*

U.S. Cl. 29—469.5 **4 Claims**

1. A method for the preparation of a flanged synthetic resinous thermoplastic lined conduit, the steps of the method comprising providing a malleable metallic conduit having a malleable synthetic resinous liner, the synthetic resinous liner being adhered to the metallic conduit at least adjacent the terminal

portions of the metallic conduit, deforming a terminal portion of the synthetic resinous lined conduit to form a generally



outwardly extending radial flange thereon while maintaining adhesion of the plastic liner to the so-formed flange portion.

4,520,548

METHOD AND APPARATUS FOR FASTENING AN ERASER TO A PENCIL

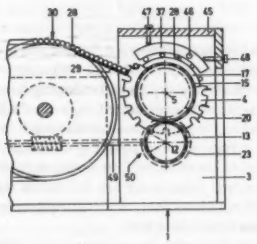
Harald H. Kremser, Postbauer-Heng, and Walter Barth, Nüremberg, both of Fed. Rep. of Germany, assignors to Bleistiftmaschinenfabrik Dipl. Ing. Karl Zuber GmbH & Co. KG, Nüremberg, Fed. Rep. of Germany

Filed Nov. 30, 1982, Ser. No. 445,524

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1981, 3147863

Int. Cl.³ B21D *39/00*

U.S. Cl. 29—517 **11 Claims**



1. An apparatus for securing an eraser to a pencil by deforming a sheath mounted at one end on one end of the pencil, with the other end of the sheath partially receiving the eraser, said apparatus comprising a first means for supporting and moving a pencil along a predetermined path of movement, said apparatus additionally comprising two members positioned contiguous to each other and to said first means for receiving between said two members said sheath while said pencil is being supported and moved by said first means, said two members defining an interspace therebetween, said interspace defining a pressure gap of decreasing dimension which is larger at its inlet end and smaller toward its outlet than the outer diameter of said sheath when said sheath is in its undeformed state, at least one of said members defining said pressure gap being provided with deformation profiles, means for introducing a pencil onto said first means and for positioning a portion of the eraser-receiving end of said pencil and additionally said sheath in said interspace between said two members, and means for relatively rotating said two members whereby to impart a rolling movement to at least said sheath while said sheath is moving through said interspace.

4,520,549

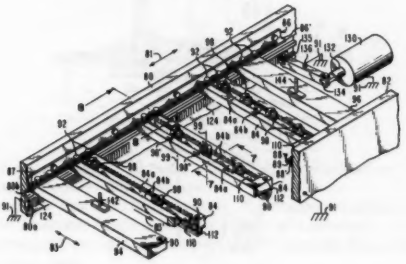
MULTIPLE COMPONENT LEAD PROCESSING APPARATUS

George J. Whitley, Philadelphia, Pa.; Martin Rayl, Lawrenceville, and William Squire, Livingston, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 31, 1982, Ser. No. 363,960

Int. Cl.³ B23P *19/00*; H05K *3/30*

U.S. Cl. 29—566.3 **18 Claims**



1. A system for concurrently processing multiple leads of one or more components, said leads extending through a printed circuit board and projecting therefrom on the side opposite the components, comprising, in combination:

a support structure;

a plurality of component lead processing assemblies lying in a plane;

means secured to said support structure for aligning a printed circuit board relative to said lead processing assemblies;

each said assembly comprising an anvil mounted to said support structure and a lead processing means rotatable relative to said anvil and cooperating with said anvil for processing said projecting leads as said lead processing means is rotated relative to said anvil;

link means coupled to a plurality of said processing means and movable relative to said support structure in a direction parallel to said plane for concurrently rotating each said processing means;

said link means comprising a plate lying in a plane parallel to said plane and connecting means corresponding to each processing assembly coupled to said plate and each corresponding lead processing means; and

drive means coupled to said plate for reciprocating said plate in directions parallel to said plane to concurrently rotate all said lead processing means a partial revolution in one rotational direction and then in the opposite rotational direction, whereby the leads of each said component are processed.

4,520,550

ROBOT TOOL CHANGER

Jimmy L. Dunn, Hurst; George L. Mayo, and Frank C. Romeo, both of Fort Worth, all of Tex., assignors to Automated Robotic Systems, Inc., Arlington, Tex.

Filed May 27, 1983, Ser. No. 498,731

Int. Cl.³ B23Q *3/157*

U.S. Cl. 29—568 **17 Claims**

1. An apparatus for installing and removing a tool on a chuck connected to a robot arm, comprising:

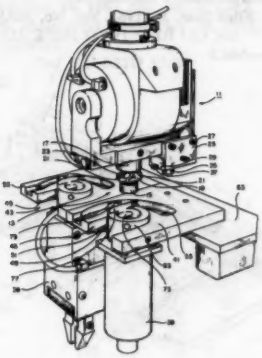
a tool coupling member on the tool;

a chuck coupling member on the chuck, adapted to mate with the other tool coupling member;

locking means for securing the coupling members together when the coupling members are aligned in a locked position, and for releasing the coupling members when the

coupling members are rotated a selected distance of less than 360° relative to one another;

support means for receiving and preventing rotation of the tool coupling member; and



guide means on one of said support means and said chuck and coacting means on one of said support means and said chuck for causing the chuck coupling member to rotate relative to the tool coupling member when the chuck places the tool coupling member in the support means and moves relative to the support means.

4,520,551

MACHINE TOOL

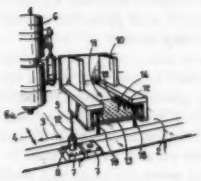
Werner Imhof, Bienne, Switzerland, assignor to Posalux S.A., Bienne, Switzerland

Filed Aug. 22, 1983, Ser. No. 525,005

Claims priority, application Switzerland, Sep. 1, 1982, 5186/82

Int. Cl.³ B23Q *3/157*

U.S. Cl. 29—568 **8 Claims**



1. A machine-tool comprising: a work-piece carrier, at least one working unit that includes a spindle adapted to drive an engaged rotatable cutting tool, drive means for effecting relative movement between the work-piece carrier and said at least one working unit in two directions; at least one container fixed in position relative to said at least one working unit, said container having a plurality of tool containing positions and including at least one tool; and at least one tool transporting device fixedly mounted on said work-piece carrier, said device including gripper means able to grip tools carried in said container; so that relative movement between the work-piece carrier and said at least one working unit can align said transporting device opposite any tool containing positions in said container, at which positions said gripper means can grip any said opposed tool, and further relative motion can align said transporting device opposite said spindle, into which said gripped tool can be engaged by said gripper means, and so that by similar operation a tool can be disengaged from said spindle and be returned to said container.

4,520,552

SEMICONDUCTOR DEVICE WITH DEEP GRIP ACCESSIBLE VIA THE SURFACE AND PROCESS FOR MANUFACTURING SAME

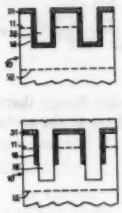
Jacques Arnould, and Eugène Tonnel, both of Paris, France, assignors to Thomson-CSF, Paris, France

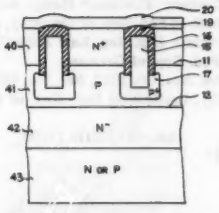
Division of Ser. No. 253,263, Apr. 13, 1981, abandoned. This application Jan. 16, 1984, Ser. No. 571,095

Claims priority, application France, Apr. 14, 1980, 80 08270

Int. Cl.³ H01L *29/80, 27/02, 21/76*

U.S. Cl. 29—571 **3 Claims**





1. A process for manufacturing a semiconductor device on a semiconductor substrate, the device including different layers of distinct conductivity type and/or doping levels, said device including an array of highly doped regions of a first conductivity type buried in a region of a second conductivity type opposite to the first type, said array being conductively connected to a metallization layer formed on a major surface of the substrate, said process comprising the following steps:

coating said major surface of the substrate with a layer of a first protecting substance,

selectively etching said first substance according to a predetermined pattern corresponding to said array to be formed,

anisotropically etching the substrate where it is not covered by said first substance, to form vertical grooves having vertical lateral walls and a bottom wall, said grooves extending to a first depth from said major surface of the substrate,

forming on the vertical walls and bottom wall of the grooves a coating of a second, electrically insulating, protecting substance,

removing said second substance from the bottom wall of the grooves through an anisotropic etching process while keeping said second substance on the vertical walls, and keeping said first substance outside said grooves,

deepening said grooves where they are not coated with said second protecting substance, by an anisotropic etching process, thereby vertically increasing the depth of the grooves to a depth greater than said first depth, and

filling the grooves with a conductive material to make electrical contact at the bottom of the grooves between said conductive material and said semiconductor substrate, said conductive material being insulated from said substrate by said second protecting layer along the vertical

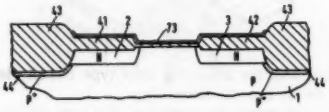
walls of the grooves from the surface of the substrate down to said first depth.

4,520,553

PROCESS FOR MANUFACTURING AN INTEGRATED INSULATED-GATE FIELD-EFFECT TRANSISTOR

Wolfgang Kraft, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 10, 1984, Ser. No. 608,784
Claims priority, application Fed. Rep. of Germany, May 19, 1983, 3318213
Int. Cl.³ H01L *21/76*
U.S. Cl. 29—571 2 Claims



1. A process for manufacturing an integrated MIS field effect transistor including source and drain regions introduced into a semiconducting substrate, contacts at the source and drain regions which are self aligned with respect to a gate electrode, the gate electrode being coated with an insulating material by thermal oxidation, contact windows in the insulating material being provided over the source and drain regions, and contacts in the windows attached to the source and drain regions and separated from the gate electrode by the insulating material, said process comprising the steps of:

depositing on the surface of said substrate an oxidation masking layer suitable for being used as an ion implantation mask, including depositing a lower partial layer and depositing an upper partial layer, said lower partial layer being selectively etchable relative to said upper partial layer and being capable of being used as said gate insulating material;

depositing on said oxidation masking layer a first photoresist mask defining source and drain region areas;

removing said oxidation masking layer from said source and drain region areas;

implanting ions of the respective conductivity type of source and drain into the surface of said substrate in said source and drain region areas to produce said source and drain regions respectively;

producing insulating layers covering said source and drain region areas by thermal oxidation;

removing at least said upper partial layer of said oxidation masking layer;

covering said source and drain region areas and a gate area with a further oxidation masking layer and defining field areas in the uncovered portions of the substrate;

covering the field areas of said substrate lying outside said further oxidation masking layer with a thick oxide layer by way of thermal oxidation;

forming contact windows in said insulating layers with the aid of a photoresist mask; and

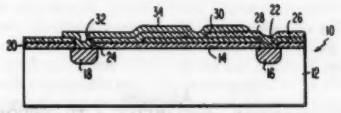
attaching contacts to said source and drain regions in said contact windows.

4,520,554

METHOD OF MAKING A MULTI-LEVEL METALLIZATION STRUCTURE FOR SEMICONDUCTOR DEVICE

Albert W. Fisher, Ringoes, N.J., assignor to RCA Corporation, Princeton, N.J.

Division of Ser. No. 465,640, Feb. 10, 1983,. This application Nov. 30, 1984, Ser. No. 676,948
Int. Cl.³ H01L *21/388*
U.S. Cl. 29—591 5 Claims



1. A method of forming a multi-level metallization on a substrate comprising the steps of:

forming a first metallization layer of aluminum containing up to 3 percent of silicon over a surface of a substrate,

forming a layer of an insulating material over the first metallization layer,

forming an opening through the insulating layer to the first metallization layer,

forming a second metallization layer of aluminum containing silicon in an amount less than that contained in the first metallization layer over the insulating layer and in the opening to contact the first metallization layer, and

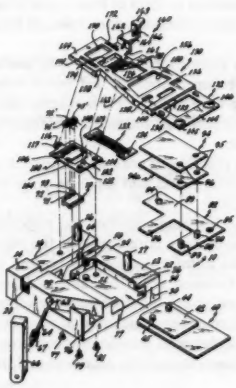
heating the metallization layer to sinter the two layers together at their junction within the opening within the insulating layer and to diffuse some of the silicon from the first metallization layer into the second metallization layer.

4,520,555

APPARATUS AND METHOD FOR ALIGNING AND ASSEMBLY OF A GIMBAL, MAGNETIC SLIDER HEAD, AND FLEXURE ARM

Ko Ko Gyi, Thousand Oaks, and Gurbachan S. Grewal, Sepulveda, both of Calif., assignors to Magnetic Information Technology, Inc., Chatsworth, Calif.

Filed Sep. 27, 1982, Ser. No. 424,073
Int. Cl.³ G11B *5/42*
U.S. Cl. 29—603 17 Claims



1. As an article of manufacture a fixture for use in assembling parts of a component of magnetic information storage apparatus, the parts including a magnetic slider head; a gimbal plate; and, a flexure arm, in combination, a fixture member having

means to removably receive and hold a magnetic slider head; the fixture having means for holding a gimbal plate in position relative to the said magnetic slider head, the said fixture having means to hold a flexure arm in aligned position relative to the gimbal plate and the magnetic slider head, the magnetic slider head, gimbal plate, and flexure arm being in position to be secured together.

4,520,556

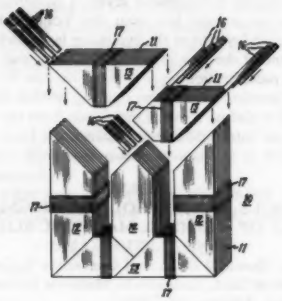
METHODS FOR ASSEMBLING A TRANSFORMER CORE

Walter J. Pasko, Jr., Lee, and William H. Rathbun, Pittsfield, both of Mass., assignors to General Electric Company, King of Prussia, Pa.

Division of Ser. No. 260,023, May 4, 1981, abandoned. This application Aug. 18, 1983, Ser. No. 524,495

Int. Cl.³ H01F *7/06*

U.S. Cl. 29—606 **2 Claims**



1. A method for creating a transformer core and winding assembly comprising the steps of:

arranging a plurality of core leg laminations and bottom core yoke laminations to form at least a pair of core legs having a bottom interconnecting core yoke, all lying in a horizontal plane;

assembling a plurality of top core yoke laminations extending between open ends of said transformer core legs to form a top core yoke and a magnetic path between said transformer core legs and said transformer top and bottom core yokes;

assembling a plurality of core steel inserts in corners formed by said core legs and said top core yoke to complete said magnetic path;

mechanically fastening together the respective laminations of said transformer core legs and the respective laminations of said transformer top and bottom core yokes;

raising said fastened core legs and said fastened top and bottom core yokes together to a standing position with said transformer legs extending in a vertical plane;

removing said fastened transformer top core yoke as a unit and said inserts to provide access to said transformer core legs;

arranging a transformer winding around at least one of said transformer core legs; and

reassembling said fastened transformer top core yoke as a unit and said inserts intermediate said transformer core legs to recomplete said magnetic path.

4,520,557

APPARATUS FOR MOUNTING CHIP TYPE CIRCUIT ELEMENTS ON PRINTED CIRCUIT BOARDS

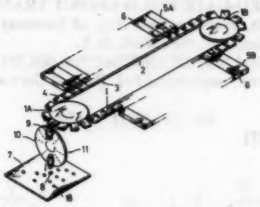
Kotaro Harigane; Shuichi Tando; Kenichi Takahashi, and Hirokazu Shudo, all of Tokyo, Japan, assignors to TDK Corporation, Japan

Filed Aug. 18, 1982, Ser. No. 409,184

Claims priority, application Japan, Aug. 24, 1981, 56-131548; Aug. 25, 1981, 56-124803[U]; Aug. 25, 1981, 56-124804[U]; Aug. 31, 1981, 56-127914[U]; Aug. 31, 1981, 56-127915[U]; Sep. 11, 1981, 56-135406[U]; Sep. 11, 1981, 56-135407[U]; Sep. 11, 1981, 56-135408[U]; Sep. 16, 1981, 56-136367[U]; Sep. 26, 1981, 56-141989[U]; Oct. 9, 1981, 56-150828; Oct. 9, 1981, 56-150829[U]

Int. Cl.³ H05K *3/30*

U.S. Cl. 29—740 **17 Claims**



1. Apparatus for mounting chip type circuit elements on printed circuit boards, comprising:

supply unit means for supplying chip type circuit elements;

a plurality of pallets and means for conveying said pallets in an intermittent fashion in a particular direction;

first shifting means for shifting said chip type circuit elements from said supply unit means onto said pallets;

an X-Y table carrying said printed circuit boards thereon;

mounting means including at least one mounting head for mounting said chip type circuit elements on a printed circuit board carried by said X-Y table; and

second shifting means for shifting said chip type circuit elements from said pallets to said at least one mounting head;

wherein each of said pallets have circuit element gripping means for mechanically receiving and gripping said chip type circuit elements; and

wherein said at least one mounting head has circuit element gripping means for mechanically receiving and gripping said chip type circuit elements;

so that said chip type circuit element supplied by said supply unit means is positively gripped mechanically until it is mounted on said printed circuit board.

4,520,558

TOOL FOR MATRIX CONNECTOR

Edward D. Bunnell, Palm Harbor, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 19, 1983, Ser. No. 543,597

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—749 **1 Claim**

1. A tool for programmable termination of a plurality n of wires to a plurality n of adjacent terminals in an electrical connector, said connector having a base with said terminals mounted therein, each terminal having a plurality n of wire receiving portions each having a wire receiving slot, said slots of adjacent terminals forming a plurality n of rows of slots, said slots as a whole forming an n×n array, said tool comprising:

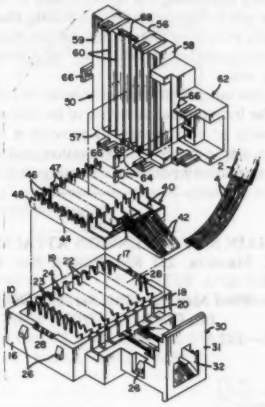
a housing;

a cover hinged to said housing, said cover being pivotable from an open position to a closed position, said cover having a top surface and an opposed bottom surface which faces said housing when said cover is closed;

a plurality n of wire inserters extending from the bottom

surface of said cover, each said inserter being slidable relative to said cover to a plurality n of fixed positions spaced as the wire receiving portion of a terminal, said positions as a whole forming an n×n array spaced as said wire receiving slots;

nest means carried in said housing, said nest means being movable perpendicularly to said bottom surface of said cover when said cover is closed, said nest means being



profiled to position said base with said array of slots paralleling said array of inserters when said cover is closed,

actuating means for moving said nest means toward said cover when said cover is closed whereby, upon laying a plurality n of said wires in an array against said base with each wire overlying a row of slots, any wire may be connected to any terminal by positioning said inserters in the appropriate positions.

4,520,559

APPARATUS FOR PAIRING TWO ROWS OF SLIDE FASTENER ZIGZAG COUPLING ELEMENTS

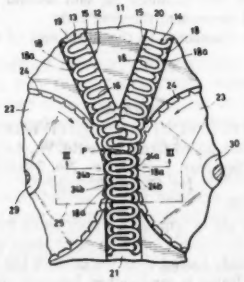
Kihei Takahashi, Uozu, and Yusei Sassa, Namerikawa, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jan. 12, 1984, Ser. No. 570,252

Claims priority, application Japan, Jan. 20, 1983, 58-8561

Int. Cl.³ A41H *37/06*; B21D *53/52*

U.S. Cl. 29—766 **5 Claims**



1. An apparatus for interengaging a pair of rows of continuous slide-fastener zigzag coupling elements, each element having a coupling head, a pair of spaced legs extending from the coupling head in a common direction, and a connecting portion disposed remote from the coupling head and extending between one of the legs and a corresponding one leg of an adjacent coupling element, said apparatus comprising:

(a) a base defining therein a substantially Y-shaped guide channel including a pair of branch guide passages for receiving disengaged rows of coupling elements, respectively, said branch guide passages being joined together into a joint passage for mating the disengaged rows of coupling elements, said joint passage having a width narrow enough to substantially prevent interengaged rows of coupling elements from moving laterally with respect to each other; and

(b) a pair of coplanar guide wheels rotatably mounted on said base one on each side of said joint passage for guiding therebetween the interengaged rows of coupling elements, each said guide wheel having a plurality of peripheral teeth engageable with the interengaged rows of coupling elements for feeding the rows of coupling elements through said guide channel, two adjacent ones of said teeth projecting into said joint passage for holding therebetween one connecting portion at opposite ends thereof.

4,520,560

APPARATUS FOR HOLDING A SLIDE FASTENER SLIDER

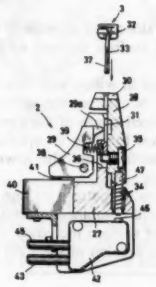
Toshiaki Nakagawa, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,119

Claims priority, application Japan, Nov. 17, 1982, 57-173959[U]

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—708 **6 Claims**



1. An apparatus for holding a slider in position during threading onto a slide fastener chain, the slider including a slider body and a pull tab pivotally connected to the slider body on its upper side and having an opening, said apparatus comprising:

(a) a base;

(b) an elongate support vertically slidably mounted on said base, said support having at its upper end a seat for supporting thereon the slider body upside down, and a longitudinal slit opening into said seat for receiving the pull tab hanging from the slider body supported on said seat, said support being slidable on said base between an upper position and a lower position;

(c) a first spring acting between said base and said support to normally urge the latter to said upper position;

(d) means for detecting when said support, as manually pressed downwardly against the bias of said first spring, arrives at said lower position;

(e) a lever pivotally mounted on said base and having a locking projection, said lever being pivotable between a slider-holding position in which said locking projection projects into said slit for engagement with an edge of the opening of the pull tab, and a slider-release position in which said locking

projection is retracted out of said slit for releasing the pull tab;

(f) a second spring acting between said base and said lever to normally urge the latter to said slider-release position; and

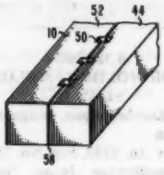
(g) means, responsive to detection of the arrival of said support by said detecting means, for driving said lever from said slider-release position to said slider-holding position against the bias of said second spring.

4,520,561

METHOD OF FABRICATING AN ELECTRONIC CIRCUIT INCLUDING AN APERTURE THROUGH THE SUBSTRATE THEREOF

Richard Brown, Union County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 16, 1983, Ser. No. 562,244
Int. Cl.³ H05K *3/34*
U.S. Cl. 29—840 **4 Claims**



1. A method for fabricating an electronic circuit on first and second slabs of electrically insulating substrates including at least one aperture through the substrates, comprises the steps of:

a. cutting at least one slot along an edge of said one substrate between an upper surface thereof and a lower surface thereof;

b. metalizing said edge in which said slot is formed;

c. metalizing an edge of said second substrate;

d. securing the metalized edges of the first and second substrates together, thus forming an aperture extending between the upper surface and the lower surface of the combined substrates;

e. forming a printed circuit pattern on one of said upper and lower surfaces of said combined substrates; and

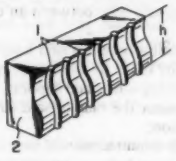
f. metalizing the other surface including a connection with the metalized edges created in steps (b) and (c) above.

4,520,562

METHOD FOR MANUFACTURING AN ELASTIC COMPOSITE BODY WITH METAL WIRES EMBEDDED THEREIN

Ryoichi Sado, and Kazutoki Tahara, both of Saitama, Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 206,064, Nov. 12, 1980, abandoned. This application Nov. 4, 1983, Ser. No. 549,014
Claims priority, application Japan, Nov. 20, 1979, 54-150369
Int. Cl.³ H01R *43/02*
U.S. Cl. 29—878 **1 Claim**



1. A method for manufacturing an elongated piece of a composite body composed of a polymeric body of an elongated form and a plurality of linear bodies of an electroconductive material embedded in the elongated body in alignment, each of the linear bodies extending in the transverse direction of the elongated body in substantial parallelism with each other and being in a form, which comprises the steps of

(a) integrally bonding a plurality of straight linear bodies of an electroconductive material on at least one of the surfaces of a polymeric sheet in alignment and substantial parallelism with each other,

(b) plastically deforming the linear bodies in corrugation with a regular pitch together with the plastic sheet,

(c) integrally providing a layer of a rubber overlying the array of the corrugated linear bodies to give an integrated composite body, and

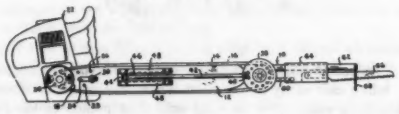
(d) cutting the integrated composite body in a plane perpendicular to the longitudinal direction of the linear bodies about a single pitch of corrugation to provide a composite body having a single pitch of corrugation and two oppositely facing substantially parallel contacting end surfaces.

4,520,563

CHAIN SAW EXTENSION ATTACHMENT

Aurilien J. Marceau, 221 S. Johnston, Box 49, Kenney, Ill. 61479

Filed Mar. 12, 1984, Ser. No. 588,338
Int. Cl.³ B27B *17/02, 19/00*
U.S. Cl. 30—122 **14 Claims**



1. A reciprocating saw attachment for a chain saw wherein said chain saw includes a rotating drive and a guide bar, comprising:

a second guide bar for replacing the first mentioned guide bar, said second guide bar having an elongated aperature in the body thereof and a slide block reciprocally moveable in said aperature;

a wheel mounted on said second guide bar, said wheel having connecting means eccentric thereof;

a crank lever having one end thereof connected to said connecting means and the other end thereof connected to said slide block;

an endless link means encircling said second guide bar, said rotating drive of said chain saw, and said wheel for rotating said wheel;

an elongated rod mounted on said second guide bar for reciprocal movement thereon; and

a saw blade connected to the distal end of said elongated rod.

4,520,564

TOOL FOR REMOVING AUTOMOTIVE DOOR PANELS

Gerald P. Wivinis, 25889 Grass Lake Rd. W., Antioch, Ill. 60002

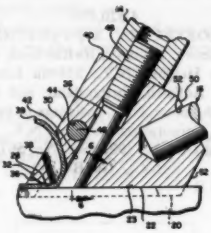
Filed Nov. 7, 1983, Ser. No. 548,922
Int. Cl.³ B26B *3/00*
U.S. Cl. 30—168 **10 Claims**

1. A tool for use in removing a door panel from an automobile door, the door panel being an outer sheet metal skin with its edges reversely folded over the edge of the door frame so that the door frame is sandwiched between the folded over edge and the outer sheet metal skin, said tool comprising:

a head having at least a front wall, a back wall and a bottom wall;

a stepped guide groove formed in said bottom wall and extending from said back wall to said front wall and having a first and a second bottom surface, said second bot-

tom surface being deeper in depth than said first bottom surface;



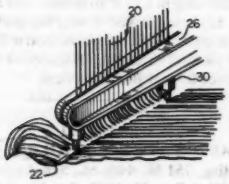
a cutting bit disposed with the cutting edge thereof co-planar with said first bottom surface of said guide groove, said second bottom surface of said guide groove being forward of said cutting bit.

4,520,565

HAIR CUTTING GUIDE APPARATUS AND METHOD

Lynne D. Maggiore, 229 Continental La., Schaumburg, Ill. 60194

Filed Oct. 27, 1983, Ser. No. 545,891
Int. Cl.³ A45D *24/36*
U.S. Cl. 30—201 **1 Claim**



1. A hair cutting guide apparatus comprising:
a first and second jaw member;
means for urging said jaw members in position one against the other;
a plurality of extending portions depending from said first jaw; and
means for increasing the length of said extending portions comprising a plurality of spacers of predetermined length arranged for removable attachment to said first jaw member.

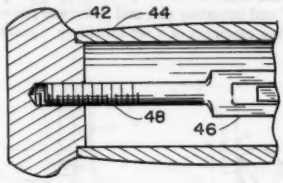
4,520,566

SHEAR PIN HILT FOR KNIFE

Kurtis D. Davis, P.O. Box 57, Bixby, Okla. 74008

Continuation-in-part of Ser. No. 515,200, Jul. 20, 1983, Pat. No. 4,458,420. This application Feb. 23, 1984, Ser. No. 582,893
Int. Cl.³ B23P *11/00*
U.S. Cl. 30—342 **3 Claims**

1. An impact-resistant handle with tool comprising:
(a) a substantially hollow tubular handle member;
(b) a first end piece covering one end of said hollow tubular handle member wherein said first end piece has an opening therein for accepting one end of a tool;
(c) a tool wherein one end of said tool extends through said opening in said first end piece terminating within said handle member;
(d) a second end piece covering the other end of said hollow tubular handle wherein said second end piece includes an internally threaded bore to threadably engage one end of a shear pin means; and
(e) a shear pin means within said handle member wherein the other end of said shear pin means is attached to said terminal end of said tool and said one end is threadably engaged to said internally threaded bore in said second end piece



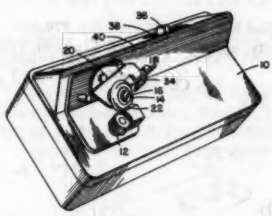
such as to apply compressive force to said handle through said shear pin means and hold said handle and tool in an assembled state.

4,520,567

POWER PIERCE CAN OPENER

John G. Crawford, Monroe, Conn., assignor to Black & Decker, Inc., Newark, Del.

Filed Apr. 18, 1983, Ser. No. 485,593
Int. Cl.³ B67B *7/38*
U.S. Cl. 30—424 **7 Claims**



1. An electric powered can opener having a housing, a feed gear rotatably mounted to drivingly hold and rotate a can by its rim, an operating lever pivoted above said gear on the housing and carrying a cutter mechanism to contact and remove the can lid, an improvement in said mechanism comprising:
a cutter wheel rotatably pivoted at one end of said lever, said wheel having a flat chordal portion on and within the wheel periphery
said wheel being located on said lever so a line drawn through said wheel pivot and said lever pivot falls inside the meeting edge of said flat and said wheel periphery when said flat lies along the lid of a can,
whereby the cutter free wheels until the meeting edge contacts the can, outside said line and the flat is forced stationary into and pierces the can lid whereupon the cutter rotates severing the lid.

4,520,568

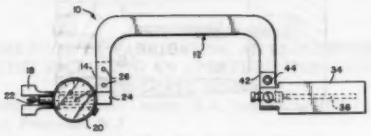
BRAKE DRUM GAUGE

Dewey A. Drenner, Glen Burnie, Md., assignor to 4D Incorporated, Baltimore, Md.

Filed Mar. 27, 1984, Ser. No. 593,922
Int. Cl.³ G01B *5/12, 3/22*
U.S. Cl. 33—143 R **14 Claims**

1. A brake drum gauge comprising a frame having a first end and a second end, said first end having attached thereto a support adapted to rest on the rim of a brake drum and a micrometer including an outwardly biased reciprocative actuating pin with a free end adapted to engage the inner surface of

said brake drum, said second end having removably attached thereto an additional support adapted to rest on the rim of said brake drum substantially opposite the first mentioned support and a reference pin with a free end adapted to engage the inner surface of said brake drum at a point diametrically opposite the free end of said actuating pin, said reference pin and additional support being elements of a set including a plurality of reference pins and corresponding additional supports adapted for removable attachment to the second end of said frame, each reference pin having a free end adapted for engagement with the inner surface of a brake drum of corresponding prescribed nominal diameter when that pin is attached to said second end, the additional support corresponding to that pin being adapted to rest on the rim of the same brake drum when attached to said second end.



4,520,569

COMPONENT MEASURING INSTRUMENT

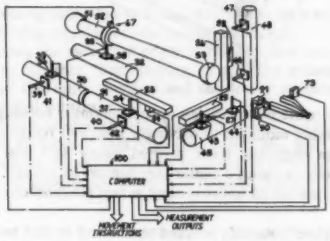
Eric Ireland, Letchworth, England, assignor to Sigma Ltd., England

Filed Feb. 10, 1984, Ser. No. 579,011

Claims priority, application United Kingdom, Feb. 12, 1983, 8303961

Int. Cl.³ G01B *7/28*

U.S. Cl. 33—148 E **13 Claims**



1. A component measuring instrument comprising a base, a carriage mounted for movement on the base along a first axis, an are mounted on said carriage for angular movement relative thereto about a point on the carriage, a cradle supporting the arm at a position spaced from said point, means supporting the cradle on the carriage for movement along second and third axes which are perpendicular to one another and to said first axis, whereby a free end of the arm is movable to any point on an imaginary part spherical surface with its centre at said point, first measuring means for measuring the position of the carriage relative to the base in the direction of the first axis, second and third measuring means for measuring the position of the cradle relative to the carriage in the direction of said second and third axes respectively, caliper means mounted on the free end of the arm and having a pair of contact tips which are urged together along predictable locii passing through and substantially normal to the centre line of said arm, to a predetermined rest position relative to the arm, means for turning said caliper means about a fourth axis extending through said point and through said centre line of said arm, and fourth measuring means on the caliper means for measuring the position of each of said contact tips, whereby a measurement of a component can be made using said caliper means at any position within a range of positions determined by the ranges of movement of said carriage and said cradle.

4,520,570

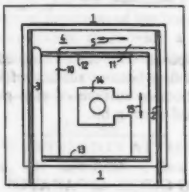
PIEZOELECTRIC X-Y-POSITIONER

Johannes G. Bednorz, Adliswil, Switzerland; Ralph L. Hollis, Jr., Yorktown Heights, N.Y.; Martin Lanz; Wolfgang D. Pohl, both of Adliswil, Switzerland, and Celia E. Yeack-Scranton, South Salem, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,306

Int. Cl.³ G01B *5/00*

U.S. Cl. 33—180 R **6 Claims**



1. Piezoelectric X-Y-positioner of the parallelogram type having a fixed frame and a support frame movable with respect to said fixed frame and adapted for supporting the device to be positioned, characterized by at least one intermediate frame (**4**; **36**; **49** . . . **52**) linked to said fixed frame (**1**, **29**, **44** . . . **46**) by at least one pair of first piezoelectric benders (**2**, **3**; **30**, **31**; **47**, **48**) in parallel extending in a first direction, said intermediate frame (**4**; **36**; **49** . . . **52**) being linked to said support frame (**14**, **43**, **56**) by at least one pair of second piezoelectric benders (**12**, **13**; **37**, **38**; **53**, **54**) in parallel extending in a second direction orthogonal with respect to said first direction.

4,520,571

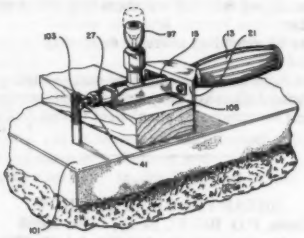
BASE PLATE BOLT HOLE MARKER

Delbert Harding, 751 W. 44th St., San Angelo, Tex. 76903

Filed Oct. 31, 1983, Ser. No. 547,230

Int. Cl.³ B23B *49/02*; B25H *7/04*

U.S. Cl. 33—189 **4 Claims**



1. A base plate bolt hole marker of the type used to mark bolt holes on a base plate in slab construction where foundation bolts are provided at spaced intervals along the edge of a concrete slab, comprising:

a handle portion;

a measuring arm slidably received within said handle portion, said measuring arm having a bolt engaging end;

a marking member carried on said measuring arm for marking the location of a bolt hole on a base plate;

a depending flange affixed to said handle portion for aligning said marker with respect to said base plate whereby said measuring arm extends generally perpendicular to the longitudinal axis of said base plate when said depending flange contacts said base plate, the distance between said

bolt engaging end and said depending flange being adjustable by varying the position of said measuring arm with respect to said handle portion to mark bolt holes in base plates of varying widths; and

wherein said bolt engaging end of said measuring arm is adjustable to vary the length of said measuring arm.

4,520,572

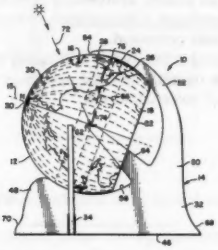
GEOGRAPHICAL SUNDIAL

Athelstan Spilhaus, Box 1063, Middleburg, Va. 22117

Filed Mar. 14, 1984, Ser. No. 589,425

Int. Cl.³ G04B *49/02*

U.S. Cl. 33—270 **11 Claims**



1. A sundial comprising

a transparent, hollow globe having a polar axis and having latitude and longitude markings;

a base for rotatably supporting said globe with said polar axis inclined toward the geographic south pole of the earth;

index means secured to said base, said globe being rotatable with respect to said index means to position a selected latitude and longitude on the surface of said globe at said index means;

reflector means; and

support means mounted on said base and supporting said reflector means, said support means locating said reflector means on said polar axis and at the center of said globe for reflecting an image of sunlight entering said globe to a location on said globe which corresponds to solar noon.

4,520,573

GUIDE RAIL FOR A DRAWING MACHINE CARRIAGE

Heinrich Otten, Wilhelmshaven, Fed. Rep. of Germany, assignor to Franz Kuhlmann Prazisionsmechanik und Maschinenbau GmbH & Co. KG, Wilhelmshaven, Fed. Rep. of Germany

Filed Jan. 24, 1983, Ser. No. 460,485

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1982, 3202191; Sep. 3, 1982, 3232776

Int. Cl.³ B43L *13/02*

U.S. Cl. 33—438 **13 Claims**

1. A guide rail for a drawing machine carriage comprising:

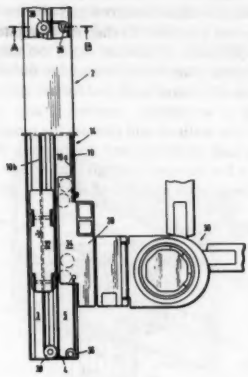
a housing forming a track configuration for the guidance of the carriage;

said housing including first and second spaced apart longitudinally extending surfaces which form a first slot adjacent to said track configuration;

carriage means traveling on said track configuration and supported thereby, said carriage means extending through said slot;

a covering element comprising a continuous band which covers the first slot along the length of the slot and which is connected to the carriage means;

said housing forming a first hollow chamber for the guidance of a counterweight and a second hollow chamber for the guidance of said carriage means, and a second longitudinal slot between said first and second hollow chambers, wherein as the carriage means moves one face of the continuous band travels adjacent with the first longitudinal slot and the other face of the continuous band travels



through the first hollow chamber and is attached to the counterweight.

4,520,574

PROCESS FOR DRYING FOODS UNDER REDUCED PRESSURE

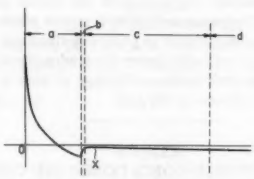
Ko Sugisawa; Yasushi Matsumura, both of Nara, and Kazumitsu Taga, Neyagawa, all of Japan, assignors to House Food Industrial Co., Ltd., Osaka, Japan

Filed Nov. 23, 1983, Ser. No. 554,862

Claims priority, application Japan, Feb. 25, 1983, 58-31690; Feb. 25, 1983, 58-31691; Mar. 3, 1983, 58-34925

Int. Cl.³ F26B *5/06*; F25B *19/00*

U.S. Cl. 34—5 **12 Claims**



1. A process for drying a food under a reduced pressure, comprising the steps of:

(a) placing said food to be dried in an environment of reduced pressure low enough for freezing water contained in said food thereby to vaporize a portion of said water and to freeze the balance of said water by the action of the heat absorbed by vaporization;

(b) heating the thus frozen food for drying it; and

(c) returning the environment surrounding said food back again to the atmospheric pressure.

4,520,575

IMPINGEMENT OVEN AND METHOD

Donald P. Holmes, and David I. McDonald, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 25, 1983, Ser. No. 554,967

Int. Cl.³ F26B *3/00*

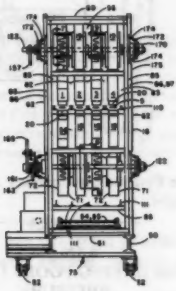
U.S. Cl. 34—23 **22 Claims**

1. An impingement oven module for heating a generally planar workpiece of resin by directing a flow of heated fluid substantially normally against at least one surface of the workpiece comprising

a housing defining an enclosure within which occur heating and heated gaseous fluid flow and having side, bottom, top and end walls and within said enclosure

a pair of plenum chambers arranged side-by-side

each plenum chamber having an elongated nozzle plate and a plurality of plenum walls defining said plenum, said nozzle plate being means for defining a perforate one of said plenum walls and for exhausting heated fluid against a workpiece, gaseous pump impeller means within the walls of said plenum for removing fluid from within said enclosure and discharging fluid within the plenum for exhaust through said nozzle plate, a heater wall comprising another of said plenum walls and disposed facing and spaced from the heater wall of the other plenum of the pair, impeller inlet means on said heater wall aligned with said impeller heater means disposed on said heater wall at the inlet means for heating fluid drawn from said enclosure before the fluid reaches said impeller means,



the respective nozzle plate for each plenum in the pair being generally coplanar with the nozzle plate of the other such plenum so that both nozzle plates discharge against the workpiece in generally the same direction,

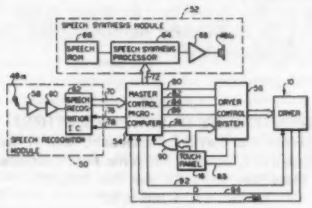
the inlet means of each plenum protruding from its respective heater wall and overhanging at least a portion of the other plenum in the pair.

4,520,576

CONVERSATIONAL VOICE COMMAND CONTROL SYSTEM FOR HOME APPLIANCE

Donald R. Vander Molen, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 6, 1983, Ser. No. 529,504
Int. Cl.³ F26B *21/06*
U.S. Cl. 34—45 **8 Claims**



1. A method of preparing an appliance having an openable door for operation comprising the steps:

(1) recognizing a first voice command,

(2) counting pulses from a source of timing signals on a counter,

(3) recognizing a second voice command within a predetermined time span of the recognition of said first voice command,

(4) automatically opening a door of said appliance in response to the recognition of the voice commands,

(5) emitting a first audible synthesized speech signal indicating that said door is open,

(6) sensing the positional condition of said door,

(7) emitting at least one additional audible synthesized speech signal requesting an input command after said door is sensed to be closed,

(8) receiving the input command in response to said signal,

(9) emitting an audible synthesized speech signal indicating that said appliance is in condition to begin operation after receiving said command,

(10) recognizing a final voice command, and

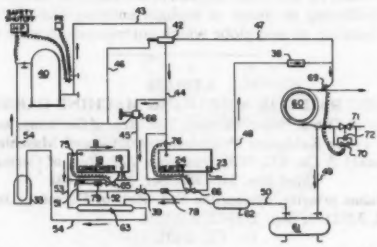
(11) initiating operation of said appliance upon recognition of said final voice command.

4,520,577

CLEANING APPARATUS

Moshe Suissa, 5561 Alpine Ave., Cote St. Luc, Montreal, Quebec, Canada

Filed Apr. 4, 1983, Ser. No. 482,088
Claims priority, application Canada, Apr. 2, 1982, 400389
Int. Cl.³ F26B *11/04*
U.S. Cl. 34—76 **6 Claims**



1. An apparatus for performing drying and cooling cycles on dry cleaned items and for recovering cleaning solvents therefrom, including:

drum means for receiving said items for treatment with cleaning solvent;

circulating means for drawing air through said drum means following said treatment;

condensing means for condensing solvent vapors entrained in said heated air during said drying cycle;

heater means for heating the air drawn through said drum means during the drying cycle of said apparatus; and

gas compresser means to supply cold refrigerant and hot gas to said condensing means and hot gas to said heater means during said drying cycle; and cold refrigerant to said heater and condensing means during said cooling cycle of said apparatus.

4,520,578

DRYING CYLINDER ADAPTED TO BE HEATED WITH STEAM

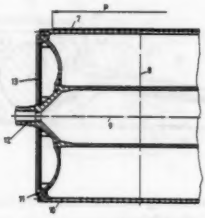
Christian Schiel; Georg Zürn, and Karl Schmid, all of Heidenheim, Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,432

Claims priority, application Fed. Rep. of Germany, May 26, 1982, 3219714

Int. Cl.³ F26B *25/20*

U.S. Cl. 34—110 **10 Claims**



1. A drying cylinder adapted to be heated with steam, comprising:

a cylindrical cylinder jacket having opposite open ends; the cylinder jacket having a flange defined on each of its open ends; each jacket flange having a substantially rectangular cross-section, and having an axial length in the direction of the axis of the cylinder which is at least as great as the radial thickness of the jacket flange;

opposite end covers covering the open ends of the jacket; each cover having a relatively small wall thickness and being curved inwardly of the jacket and toward the other cover, whereby each cover is concave as viewed from the outside of the cylinder; the cover including a connection flange thereon having a cross-section which is substantially L-shaped, wherein the connection flange includes an axial arm extending toward the axial center of the cylinder and toward the other cover and a radially outwardly extending arm located axially toward the outside of the cover; the axial arm of the connection flange having at least the same length as the radial arm thereof; the jacket flange being received in the L-shaped space defined by and lying against the arms of the connection flange;

the cylinder jacket and the covers being shaped so that when they are viewed in cross-section through the connection flange of the end cover, the point of intersection of the center line running through and along the center of the cross-section of the cover with the center line running along the radial center of the cross-section of the axial arm of the connection flange lies generally in the axial middle of the axial arm of the connection flange.

4,520,579

TOBACCO BIN

Dan De Cloet; Ben De Cloet, both of Tillsonburg, and Ted Krempa, Simcoe, all of Canada, assignors to De Cloet Ltd., Ontario, Canada

Filed Jun. 16, 1983, Ser. No. 504,885

Claims priority, application Canada, Mar. 9, 1983, 423246

Int. Cl.³ F26B *9/06*

U.S. Cl. 34—204 **23 Claims**

1. A tobacco curing bin for use in a tobacco curing kiln, the said bin comprising a box-like structure with opposing ends, a top, a front, a back, a floor, and having tynes adapted to pierce and support the tobacco leaves therein;

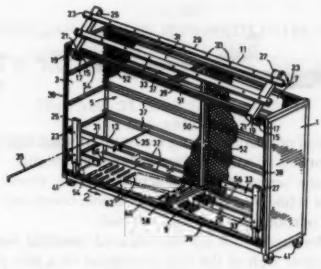
each said end being impervious to the flow of curing air;

said front having spaced holes to receive said tynes and having at least one pivotally mounted gate to permit loading and unloading the bin;

said back providing a support for the tobacco leaves in the bin when the bin is being loaded or unloaded and further being perforated to receive said tynes;

said tynes passing through said holes in the front, to pierce the tobacco leaves and engage with said back to support the tobacco leaves within the bin;

said floor being pervious to the flow of curing air and being characterized in that said floor slopes upwardly from both said opposing ends to a middle portion in said floor to



thereby permit improved flow of curing air through said floor, the tobacco leaves, and out said top of the bin to affect curing of the tobacco leaves therein;

each said end being further adapted to be adjacent to and seal against an inside portion of said kiln to prevent the flow of curing air about the ends of the bin; and

said tobacco bin having seal means to seal against other like tobacco bins in the kiln to prevent the flow of curing air between adjacent tobacco bins.

4,520,580

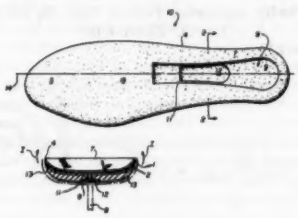
SKATE BOOT INSERT

Dennis N. Brown, 1091 Fir Ave., Blaine, Wash. 98230

Filed Mar. 30, 1982, Ser. No. 363,548

Int. Cl.³ A43B *13/38*

U.S. Cl. 36—44 **16 Claims**



10. An orthotic appliance comprising in combination:

a multi-layered insert including at least a top layer and a bottom layer and configured to generally conform to a plantar surface of a person's foot, the insert further including an upwardly-curved peripheral lip circumscribing a heel area of the foot, and

the bottom layer having a substantially longitudinal keyway-shaped downwardly opening indentation formed therein substantially from the metatarsal head area into the calcaneal region, whereby the insert will deform due to the person's weight substantially over the indentation, thereby causing the peripheral lip to cup inwardly for improved gripping of the person's heel.

4,520,581

CUSTOM FOOTBED SUPPORT AND METHOD AND APPARATUS FOR MANUFACTURING SAME

J. Michael Irwin, 7730 B, SW. Spruce St., Tigard, Oreg. 97223, and Jay P. White, Tigard, Oreg., assignors to J. Michael Irwin, Portland, Oreg.

Filed Dec. 30, 1981, Ser. No. 335,645
Int. Cl.[3] A43B *13/38, 19/00;* A61F *5/14*
U.S. Cl. 36—88 23 Claims

1. A method of manufacturing a custom footbed support for use in supporting a foot in a shoe or boot comprising:

positioning a lamina of a liquid-activated fabric sheet casting material while in a wet uncured flexible condition over a domed portion of a resilient foot pad;

placing the user's foot on the uncured material with the longitudinal arch of the foot positioned on a side portion of the domed portion of the pad and with the toe and heel portions of the foot overlying the pad, and applying weight to the foot to form a contoured shape corresponding to the undersurface of the foot in the material;

while continuing to apply weight to the foot, allowing the material to at least partially cure, and then removing the foot from the material such that the material retains the foot contoured shape;

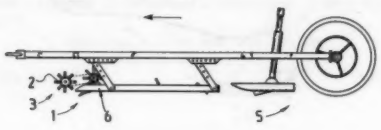
removing the substantially cured material from the pad and trimming the shaped material to size about the impression so as to fit within the shoe or boot.

4,520,582

SKI TRAILS ROTARY CUTTER AND CRUSHER DRAG UNIT

Tapio Niemelä, Linnatie 10 D 5, 99100 Kittilä , Finland

Filed Mar. 7, 1984, Ser. No. 586,994
Claims priority, application Finland, Mar. 18, 1983, 830907
Int. Cl.[3] E01H *4/00*
U.S. Cl. 37—222 3 Claims



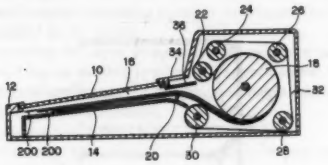
1. Apparatus for making ski trails, and apparatus being adapted to be towed and comprising a drag, a cutter unit mounted on the drag rotatable about an axis transverse to the direction of travel of the apparatus, said cutter unit carrying radial blades and being operable to break up tamped tract surface of snow and deriving its rotary motion from the tamped track surface, means for shaping trail grooves disposed behind the drag, a snow-crushing unit carrying radial snow crushing blades mounted on the drag behind the cutter unit rotatable about an axis transverse to the direction of travel of the apparatus, and transmission means connecting the crushing unit to the cutter unit, whereby the crushing unit derives its rotary motion from the cutting unit.

4,520,583

SHEET FILE MOUNTING/DEMOUNTING MECHANISM IN AN ITEM SELECTION SIGNAL INPUT SYSTEM

Takashi Oka, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 23, 1983, Ser. No. 525,664
Claims priority, application Japan, Aug. 31, 1982, 57-152304; Aug. 31, 1982, 57-152305
Int. Cl.[3] B42F *9/00*
U.S. Cl. 40—378 13 Claims



1. A sheet file mounting mechanism comprising:

a bidirectionally rotatable drum;

a sheet file comprising a base sheet and a plurality of item lists secured to said base sheet;

an engaging member secured to one end of said sheet file; and

a claw disposed at a predetermined position of said bidirectionally rotatable drum so as to catch said engaging member, said claw comprising:

an engaging surface for catching said engaging member; and

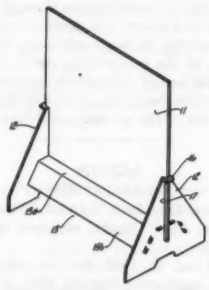
a guide surface for guiding said engaging member to said engaging surface, wherein said engaging member is secured to one end of said base sheet.

4,520,584

DISPLAY SCREENS AND THE LIKE

Robert Howard, Thornlie, Australia, assignor to Daventry Pty. Ltd., Subiaco, Australia

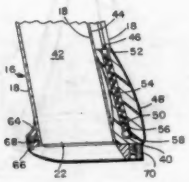
Filed May 18, 1983, Ser. No. 495,612
Claims priority, application Australia, Mar. 11, 1983, PF8409
Int. Cl.[3] G09F *15/00*
U.S. Cl. 40—606 8 Claims



1. A display screen comprising a planar display panel, a pair of end panels and a pair of brace members, each end panel being mounted at a respective side of the display panel extending transversly from said face thereof and having vertically extending surface engaging opposed portions of each face for a substantial portion of the height of the display panel, each brace member being located one to each side of the display panel and extending between said end panels and having a horizontal portion defining a surface extending between the

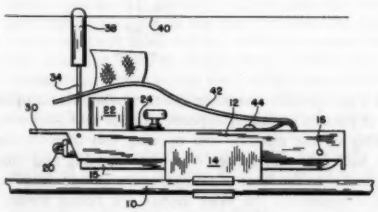
end panels and in abutting relationship with the face of the display panel.

4,520,585
PISTOL MAGAZINE LOADING GUIDE
Timothy M. Barrett, 1131 W. Duarte, No. 6, Arcadia, Calif. 91006
Filed Dec. 30, 1983, Ser. No. 567,064
Int. Cl.³ F41C *25/06*
U.S. Cl. 42—7 **18 Claims**



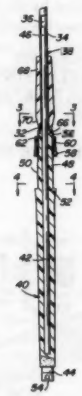
1. An improved magazine loading aid for use with a pistol comprising a base which seats against the butt of a pistol frame and which embraces the walls thereof and which defines a funnel with a magazine receiving opening in said butt of said pistol frame, and which defines transverse openings on opposite sides thereof in coaxial alignment with magazine spring housing pin receiving means in said pistol frame, and a mounting rod engaged with said base in said transverse openings, and passing through said magazine spring housing pin receiving means to secure said base to said pistol frame butt and to function as a magazine spring housing pin.

4,520,586
AUDIBLE AND BI-VISUAL INDICATOR
Louis E. Moisan, 1920 N. Main St., Lancaster, Mass. 01523
Filed Feb. 16, 1984, Ser. No. 580,734
Int. Cl.³ A01K *97/12*
U.S. Cl. 43—17 **9 Claims**



1. An indicator comprising, a housing, a light bulb on the housing, a battery, means to mount the battery in the housing,
an electric audible signal on the housing, electric grounds for said bulb and signal, an electrode for the audible signal,
a spring in the form of an electric current-carrying, resiliently deformable, elongated element, means to secure said element at one end thereof to said housing, a portion of the elongated element adjacent said one end being in the general form of a hook movable under the influence of the resiliency of the element,
said battery, bulb, and audible signal electrode being aligned,
said hook portion of the elongated element having a normal position engaging the battery to energize the audible signal and bulb simultaneously thereby,
said elongated element including a free end length normally substantially erect relative to the housing and capable of being bent down to a position close to the housing thereby moving the hook portion thereof out of engagement with the battery to deenergize the bulb and the audible signal,
and a trip member to hold the elongated element temporarily in said de-energizing position,
whereby upon release of the trip member from the elongated element, the latter assumes its erect position moving the hook portion thereof into engagement with the battery and energizing the bulb and signal.

4,520,587
TUBULAR FISHING ROD WITH INTEGRAL HANDLE-REEL SEAT
Leonard D. Wallace, 1 S. Strawberry St., Philadelphia, Pa. 19106
Filed Mar. 21, 1983, Ser. No. 477,118
Int. Cl.³ A01K *87/00*
U.S. Cl. 43—18.1 **15 Claims**



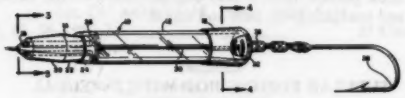
1. A fishing rod comprising a handle and a rod tip section, said rod tip section comprising a tubular section in the form of an elongated member having a free end, the outer diameter of said tubular section decreasing from a point adjacent said handle to a point adjacent said free end, said handle including a reinforcing insert having a first end portion arranged for disposition within said section and a second end portion extending into said handle, with said handle being molded in situ on said second end portion, said insert being of rod-like construction and configured to matingly frictionally engage the interior of said tubular section when said insert is disposed therein to provide good securement between said rod tip and said handle, said fishing rod including recess means within said handle permitting said insert to penetrate further into the tubular section of said rod tip section without interference caused by abutting portions of said rod tip section and said handle in the event that either of the engaging portions of the insert or the rod tip section wear away upon repeated use, to thereby maintain said good securement.

4,520,588
FISHING LURE
Charles Hindermyer, 1766 Creek Rd., Hatfield, Pa. 19440
Filed Dec. 5, 1983, Ser. No. 557,868
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.06 **11 Claims**

1. A fishing lure for use with a line bearing terminal gear, comprising:
a flexible tubular body member;
a head member attachable to the tubular body at one end and having at least one axial bore therethrough;
an end cap attachable to the tubular body at the other end

thereof and also having at least one axial bore therethrough; and,

means for preventing movement of the terminal gear through the axial bore in the end cap, the lure being threadable over the line, which passes through the bore in



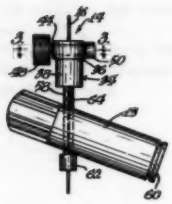
the head member, through the tubular member and through the bore in the end cap, whereby the lure flexes on the line particularly at the end cap as the lure is pushed through the water by structure of the terminal gear engaging the preventing means, as the terminal gear is itself pulled through the water by the line.

4,520,589

LOCKING AND RELEASING MECHANISM

Michael G. Lummis, Portage, Mich., assignor to Pacific Atlantic Products, Ltd., Kalamazoo, Mich.

Filed Aug. 29, 1983, Ser. No. 526,999
Int. Cl.³ A01K *91/00*
U.S. Cl. 43—43.12 **15 Claims**



1. A locking and releasing mechanism for a fishing line release adapted for use with a downrigger cable which comprises:

a hollow, elongated housing defining a longitudinal bore for receiving the downrigger cable therethrough;

locking means rotatably mounted in said housing substantially transversely to said longitudinal bore and having an eccentric portion that is positionable in said bore to vary the effective diameter thereof and to releasably wedge the cable against a wall portion defining the bore;

a hollow spindle extending from said housing and defining a central passageway for receiving the downrigger cable, the central passageway being substantially aligned with said longitudinal bore; and

mounting means on said spindle for pivotally mounting a fishing line release thereon.

4,520,590

TREE BRACE SYSTEM

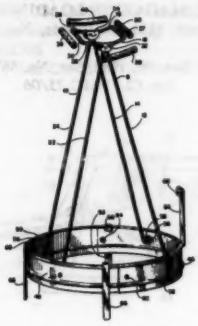
Gerald J. Schuh, 3670 Gina Pl., Las Vegas, Nev. 89103

Filed Apr. 13, 1983, Ser. No. 484,433
Int. Cl.³ A01G *17/06*
U.S. Cl. 47—43 **12 Claims**

1. A tree brace unit comprises:

a base member adapted to be ground-mounted spaced from the tree,

brace means for maintaining the tree in a substantially upright position comprising a pair of substantially identical opposing brace members, each brace member formed from a one piece metal rod, and each member having a pair of upwardly extending, substantially parallel legs, each leg having a lower end thereof attached to the base member, said legs being connected at upper portion thereof by a collar forming segment and



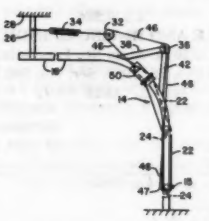
a collar formed by opposing upper collar forming segments of the brace members adapted to extend around the periphery of the tree located at an upper portion of the legs.

4,520,591

GARAGE DOOR SAFETY LOCKING SYSTEM

Michael J. Calvagno, 11 Samuel St., Nescoaset, N.Y. 11767

Filed Mar. 16, 1984, Ser. No. 590,364
Int. Cl.³ E05D *17/00*
U.S. Cl. 49—322 **5 Claims**



1. In a garage door operating system having a door opening, a pair of parallel tracks on opposite sides of said door opening extending up the sides of said opening and then turning to extend back into said garage above the opening and substantially parallel to the floor of said garage, a garage door having wheels mounted on the sides thereof for riding within said tracks permitting movement of said garage door between a vertically extending position closing said opening and a fully open position above and back from said opening substantially parallel to the floor of said garage, said door being movable between said positions, said wheels in said tracks guiding said door as the latter moves between its open and closed positions, and means comprising a spring and cable connecting said door to said garage to support at least in part the weight of said door thereby facilitating the raising and lowering of said garage door, the improvement comprising a lock assembly mounted on each of said tracks, means supported by said assembly being biased into a position extending into said track for blocking movement of said wheels, and means for connecting the garage end of said cable and spring to said biased means the force of said spring and weight of said garage door overcoming said bias and holding said biased means out of said position extending into said track, the failure of said spring or cable resulting in slackness in said cable releasing said biasing means with the

result that it moves quickly into said track and limits movement of said garage door.

4,520,592

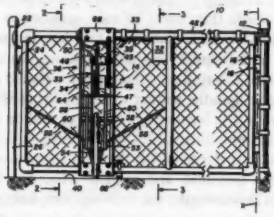
AUTOMATIC GATE OPENER

Falis E. Holloway, P.O. Box 911, Lancaster, Tex. 75146

Continuation-in-part of Ser. No. 250,543, Apr. 3, 1981. This application Sep. 2, 1983, Ser. No. 529,039

Int. Cl.³ E05F *11/00*

U.S. Cl. 49—358 **16 Claims**



1. A gate opener for use on a gate mounted to a structure for pivotal motion about a generally vertical axis, comprising:

a mounting bracket mounted on the gate for limited vertical motion;

motor means mounted on the mounting bracket for rotating a shaft;

conductor means for providing power to said motor means to rotate the shaft;

wheel means rotatably mounted on the mounting bracket and in contact with a stationary surface;

transmission means interconnecting the motor shaft and said wheel means for transmitting rotation of the shaft to said wheel means;

a receiver for activating said motor means in response to reception of an electromagnetic signal of predetermined frequency to selectively open and close the gate; and

a portable controller for transmission of the electromagnetic signal at the predetermined frequency from a position remote from the gate, the frequency being proprietary to resist unauthorized operation of the gate, the controller permitting operation of the gate between the open and closed positions from within a vehicle proximate the gate, the mounting bracket, motor means, wheel means and transmission means having their weight supported at least in part through the wheel means on the stationary surface so that the weight of the mounting bracket, motor means, wheel means and transmission means assists in providing traction to the wheel means on the stationary surface sufficient to permit the gate to be pivoted about the vertical axis with the mounting bracket, motor means, wheel means and transmission means moving vertically sufficient to move over obstructions and to follow the grade of the stationary surface.

4,520,593

INSULATED EDGE GUARD

Robert Adell, Novi, Mich., assignor to U.S. Product Development Company, Sunnyvale, Tex.

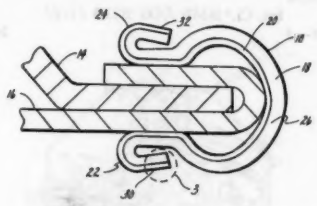
Filed Jun. 24, 1982, Ser. No. 391,619

The portion of the term of this patent subsequent to Apr. 12, 2000, has been disclaimed.

Int. Cl.³ B60J *5/00*

U.S. Cl. 49—462 **10 Claims**

1. In a vehicle body having a sheet metal body panel of a given color on a marginal edge portion of which is disposed an ornamental and protective metallic edge molding of generally U-shaped cross section comprising an inner leg and an outer leg whose free ends bear against opposite sides of said marginal edge portion and an insulating liner disposed between the metallic edge molding and said marginal edge portion, including the locations where the free ends of the legs bear against said marginal edge portion, to insulate the molding from the panel, the molding including a bead at the free end of said outer leg with the insulating liner covering the bead on the side thereof opposite the side which is disposed toward said marginal edge portion, the improvement characterized in that the insulating liner comprises two superimposed layers of plastic film, one layer being an inner plastic film via which the liner is secured to the metallic edge molding and the other of which is an outer plastic film of polyvinylfluoride which has a color matching that of said panel, said inner plastic film being a material other than polyvinylfluoride.



4,520,594

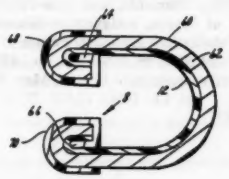
DOOR EDGE GUARD AND METHOD OF MANUFACTURE

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Sep. 19, 1983, Ser. No. 533,687

Int. Cl.³ E05F *7/00*

U.S. Cl. 49—462 **12 Claims**



1. The method of making an edge guard of the type comprising a metal strip formed into a U-shaped cross section having inner and outer legs, said method comprising applying a layer of insulation to one surface of a metal strip, forming the strip into the general U-shaped cross section of the edge guard to dispose the insulation of the interior, inwardly turning the distal marginal edge of at least one of the legs of the edge guard so that bare metal id disposed at the interior surface of the bead thus formed and a crevice is provided between each such bead and the corresponding leg, and applying a non-metallic strip over the distal end margin of said at least one leg and its bead, said non-metallic strip covering both the inwardly facing surface of the bead onto which it is applied as well as an immediately adjacent portion of the exterior of the corresponding leg of the U-shaped cross section, and disposing a marginal edge of said strip in said crevice.

4,520,595

AUTOMATIC MACHINE TOOL

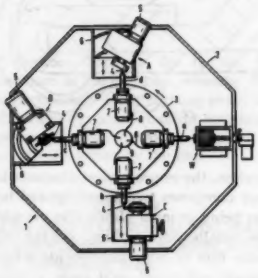
Herbert Diener, Albstadt, Fed. Rep. of Germany, assignor to Gottlieb Guhring, Ebingen, Fed. Rep. of Germany

Continuation of Ser. No. 280,832, Jul. 6, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 521,018

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1980, 3025638

Int. Cl.³ B24B 7/00; B23B 21/24

U.S. Cl. 51—3 24 Claims



1. A method for operating an automatic machine tool for machining workpieces having a plurality n of workpiece receivers where "n" is at least two or greater and an equal plurality n of work stations, the receivers or the stations being disposed at mutual angular separations of 360°/n on a rotatable index table comprising the steps of:

driving the index table from a starting position in a sequence of (n−1) rotary steps of 360°/n in one direction such that each workpiece traverses the stations in the same sequence and

driving the index table in a single rotary step of 360°(n−1)/n in the opposite direction to return the index table to the starting position.

4,520,596

GRINDING OR POLISHING MACHINE FOR OPTICAL LENSES

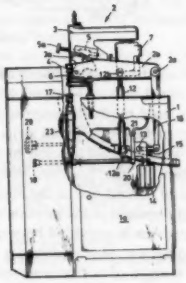
Maurice J. Otto, Marseille, and Jean-Pierre Peridont, Ollioules, both of France, assignors to Societe Anonyme dite: Etudes et Fabrications Optiques, France

Filed Mar. 15, 1983, Ser. No. 475,535

Claims priority, application France, Mar. 26, 1982, 82 05363

Int. Cl.³ B24B 13/02, 29/00

U.S. Cl. 51—55 12 Claims



1. A machine for grinding or polishing optical lenses, comprising a frame on which is mounted at least one spindle designed to carry a tool, at least one lens-support, means for delivering a polishing agent between the tool and the support, means to bring the lenses in contact with the tool, means to place the lenses on the lens-support and to remove the lenses therefrom, said lens-support being mounted for free rotation on said frame, said frame including an oscillating movable head on which the tool-holding spindle is driven in rotation above the lens-support; wherein the lens-support is carried by a vertically movable lens-support spindle mounted in a sleeve which is flared at the top to form two bearing surfaces extending horizontally and opposedly on opposite sides of the lens-support spindle; wherein the lens-support is downwardly extended by a skirt, said skirt being provided with a lower horizontal ledge extending towards the center of said support to enclose the part of the sleeve which comprises said bearing surfaces; and wherein said lens-support rests on a lens-support spindle head mounted for free rotation on a fixed pivot situated at the top of said lens-support spindle, so that when the lens-support spindle moves upwardly, the lens-suport comes to rest on said bearing surfaces and is immobilized in a horizontal position to lay the lenses thereon, in order to polish them, or to remove them once they have been polished, and so that when the lens-support spindle moves downwards, the lens-support, being apart from said bearing surfaces, can oscillate freely during the polishing of the lenses under the influence of the oscillating movable head.

4,520,597

GRINDING UNIT FOR INDUSTRIAL ROBOT AND AUTOMATIC MACHINES

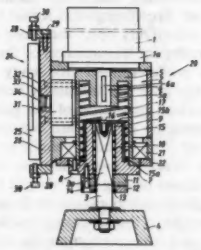
Per-Olof Lindberg, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Nov. 8, 1982, Ser. No. 439,874

Claims priority, application Sweden, Nov. 10, 1981, 8106654

Int. Cl.³ B24B 5/00

U.S. Cl. 51—134.5 R 15 Claims



1. A grinding unit which is attachable to a robot, said grinding unit comprising

a holder,

an adjustable attachment means connected to said holder for attaching said holder to a robot,

a housing having opposite ends, said housing being rotatably journalled at one of its ends in said holder,

an axial guide sleeve means mounted at the journalled end of said housing,

a grinding wheel shaft non-rotatably mounted relative to said housing but axially movably mounted between a first limit position and a second limit position, said grinding wheel shaft being capable of mounting a grinding wheel,

a stop means defining said first limit position,

spring means urging said grinding wheel shaft toward said first limit position, and

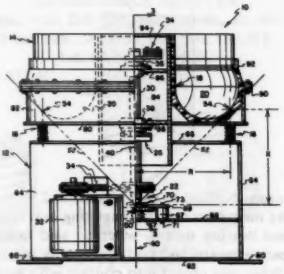
a drive motor mounted on said holder, said drive motor including a drive shaft connected to said housing to simultaneously rotate said housing and said grinding wheel shaft.

4,520,598

BOWL-TYPE VIBRATORY FINISHING MACHINE

John F. Rampe, Bratenahl, Ohio, assignor to Jepmar, Fairport Harbor, Ohio

Continuation-in-part of Ser. No. 406,976, Aug. 13, 1982, abandoned. This application Nov. 29, 1982, Ser. No. 444,362
Int. Cl.³ B24B 31/06
U.S. Cl. 51—163.2 29 Claims



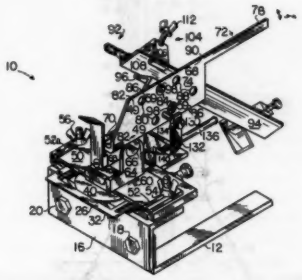
1. In a bowl-type vibratory finishing machine, including:
(a) a base structure,
(b) a generally annular bowl structure having a central axis and defining a substantially annular finishing chamber having a rounded bottom adapted to receive finishing medial and workpieces to be finished;
(c) support means interposed between and movably supporting the bowl structure on the base structure,
(d) drive means for vibrating the bowl structure relative to the base structure to impart a finishing action to contents within the finishing chamber by moving the bowl structure substantially about a nodal point located at a predetermined position along the central axis, the drive means including:
(i) a drive shaft extending with respect to said axis, said shaft being rotatable with respect to the bowl and base structure;
(ii) bearing means connected to the bowl structure and journaling the drive shaft such that rotation of the drive shaft will cause vibrations to be imparted to the bowl structure; and
(iii) power-operated drive means carried by the base structure and connected to the drive shaft to rotate the drive shaft;
the improvement therein to achieve predeterminable maximized bowl-finishing action in any such bowl-type finishing machine by specific location of said nodal point comprising:
said nodal point on said central axis defining the apex of an imaginary conical surface generated therefrom, which surface tangentially intersects the rounded bottom surface portions of said bowl structure annular finishing chamber, wherein said conical surface forms an angle of between 35 degrees and 55 degrees with said central axis, and
drive shaft restraint means disposed at said nodal point to constrain vibratory motion of said bowl structure to movements generally centering about said nodal point, said means including resilient elements cooperatively associated with said drive shaft about said axis at said nodal point to restrict gyratory motion thereof while permitting substantial gyratory motion of said bowl structure, and
means providing a positive rotative drive connection between said power-operated drive means and said drive shaft while otherwise permitting said substantial relative gyratory movement to the drive shaft at the bowl structure.

4,520,599

DRILL BIT SHARPENER

Albert Slinsky, 909 Aberdeen Ave., New Port Richey, Fla. 33552

Filed Feb. 14, 1983, Ser. No. 466,036
Int. Cl.³ B24B 3/26
U.S. Cl. 51—219 R 9 Claims



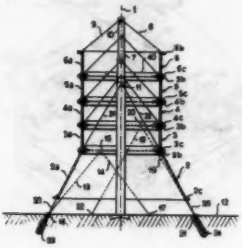
1. An apparatus for sharpening a drill bit on a grinding means, comprising,
a cradle means for holding the drill bit to be sharpened,
a cradle means holder that holds said cradle means in a predetermined angular orientation corresponding to the point angle of the drill bit held by said cradle means,
said cradle means mounted for pivotal movement in a horizontal plane and in a vertical plane,
a support means for supporting said cradle means holder,
said support means being selectively moveable away from or toward said grinding means along a line normal to the plane of said grinding means, but said support means not moving during the sharpening procedure,
said support means having a downwardly turned trailing edge,
a support means forwardmost position indicator that indicates the optimal forwardmost position of said support means and hence of said drill bit to be sharpened for a given drill bit diameter,
said indicator being disposed downwardly of said support means, in close proximity therewith, and said support means being slideable along said line with respect to said indicator,
said indicator including a rotatably mounted circular disc member,
said indicator further including a flat, generally rectangular, slideably mounted stop member,
said stop member having a generally rectangular aperture means formed therein,
said disc member and said stop member being cooperatively positioned relative to one another so that said stop member overlies said disc member, said aperture formed in said stop member permitting said disc member to be seen by the operator of said apparatus,
a plurality of visually ascertainable markings provided on said disc member,
whereby the forwardmost position of said support means for a given drill bit point angle is determined when said disc member is rotated to a preselected position, when said stop member is positioned relative to said disc member in a preselected position dependent upon the location of one of said markings, and when said support means is slid toward said grinding wheel until its downwardly turned trailing edge abuts said stop member.

4,520,600

STACKS OR VERTICAL PIPES FOR THE FLOW OF GAS

René Bordet, Courbevoie, France, assignor to Electricite de France (Service National), Paris, France

Filed Feb. 13, 1981, Ser. No. 234,435
Claims priority, application France, Feb. 18, 1980, 80 03484
Int. Cl.[3] E04B 7/14
U.S. Cl. 52—83 21 Claims



1. A stack or vertical pipe for the flow of gas, such as an atmospheric cooling tower, said stack or vertical pipe comprising:

a suspension mast defining a vertical suspension axis,

a plurality of supple surfaces, open downwardly and upwardly, symmetrical with respect to this vertical axis, superposed vertically,

a rigid, substantially horizontal upper hoop fast with the upper periphery of each surface,

a rigid, substantially horizontal lower hoop fast with the lower periphery of this surface, each hoop being symmetrical with respect to said vertical axis,

supple bearing ties suspending each upper hoop from the mast,

the lower hoop of an upper supple surface is adjacent to but independent of the upper hoop of a supple surface located immediately therebeneath, these two hoops having similar shapes and dimensions in a horizontal plane,

the lower hoops are not provided with bearing ties for suspension from the mast,

the adjacent upper and lower hoops are adapted to undergo relative movements, and

stays for connecting each lower hoop to one or more points fixed with respect to the ground, said points located at a level lower than that of said hoop to which the respective stays are connected, to stretch each supple surface between the corresponding upper and lower hoops, independently of the other supple surfaces.

4,520,601

MECHANICAL FASTENER

Albert B. Stacey, Jr., Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

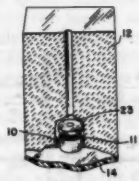
Continuation of Ser. No. 392,095, Jun. 25, 1982, abandoned.
This application Oct. 7, 1983, Ser. No. 539,230
Int. Cl.[3] E04G 21/12; E04C 5/12
U.S. Cl. 52—127.7 10 Claims

1. A device for blind side fastening an object to a supporting member comprising:

a supporting member;

an object to be placed flush against said supporting member, fastenable thereto in place from the object side only;

fastening means having structure for puncturing, biting into and adhering to said supporting member distal to the axis of rotation of said fastening means and for forming an ingress within said supporting member upon rotation with respect thereto;



bearing means bonded to said object; and

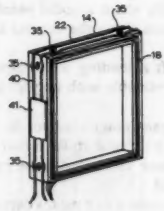
connecting means for directly engaging said fastening means with said bearing means, whereby said fastening means, said bearing means and said connecting means are operable to draw said object into contact with said supporting member to securely fasten said object to said supporting member in less than one rotation of said fastening means.

4,520,602

MULTI-PANE SEALED WINDOW AND METHOD FOR FORMING SAME

Clarence W. Miller, Bourbonnais, Ill., assignor to Thermetic Glass, Inc., Peoria, Ill.

Filed Aug. 3, 1981, Ser. No. 289,190
Int. Cl.[3] E06B 3/66, 3/24; E04C 2/38
U.S. Cl. 52—173 R 3 Claims



1. A spacer frame subassembly for a hermetically-sealed, multi-pane window, said spacer frame subassembly comprising:

A. side members and top and bottom members, said members arranged to form a frame, said members being made of material having good thermal conductivity properties, the frame having a first side surface, a second side surface, an outside surface between the two side surfaces and an inside surface diametrically opposite the outside surface;

B. a resistance heating electrical wire extending along substantially the entire outside surface of the frame;

C. a thin layer of electrical insulation material interposed between the wire and the frame, the insulation material being substantially unaffected by temperatures up to about 220° F. so that the insulation material does not degrade at said temperatures; and

D. fastening means for maintaining the wire and the interposed insulating material and the outside surface of the frame in direct surface-to-surface contact; and

E. a first bead of thermoplastic sealant extending along the first side surface of the frame;

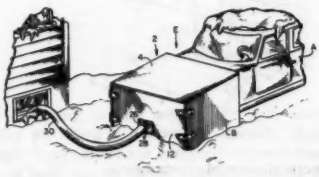
F. whereby a source of electrical energy can be attached to the ends of the wire to cause the wire to heat up along its length and thereby transfer heat to the outside surface of

the frame, which heat is transmitted through the frame to the two side surfaces and through the first side surface to said bead of thermoplastic sealant so that said heat will soften the sealant and enhance the sealant flowability and adhesion characteristics.

4,520,603
AUTOMOBILE SHELTER

Earl W. Brogle, P.O. Box 336, Warrenville, Ill. 60555

Filed Feb. 28, 1983, Ser. No. 470,072
Int. Cl.³ E04H *14/00*
U.S. Cl. 52—173 R 11 Claims



1. An automobile shelter comprising a housing, said housing including a front portion having an opening therein and being adapted to receive an engine compartment portion of an automobile, said front portion having means for fitting snugly completely around said automobile, a floor portion adapted to receive wheels of said automobile engine compartment, a roof portion adapted to overlie said automobile engine compartment, and a back portion enclosing one end of said housing, and a heat supply source connected to said housing and adapted to influence the ambient temperature within said housing, whereby to influence the temperature of said automobile engine compartment, said floor, side and roof portions each being of a length extending from a point forward of, but proximate, a forward-most portion of said automobile to a point forward of, but proximate, the forward extent of a front windshield portion of said automobile.

4,520,604
SKYLIGHT STRUCTURE

Jay F. Halsey, Lake Hopatcong, and Jeffrey M. Briggs, Oak Ridge, both of N.J., assignors to RCA Corporation, Princeton, N.J.

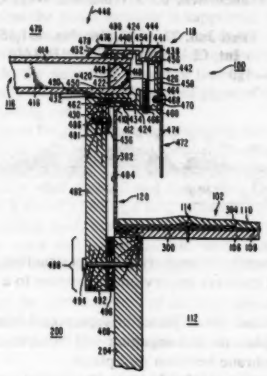
Filed Nov. 23, 1983, Ser. No. 554,850
Int. Cl.³ E04B *7/18*
U.S. Cl. 52—200 12 Claims

1. A skylight structure for enclosing an opening in a wall, comprising:

an annular curb member including a flange element for securing the member to and exterior from said wall and an upstanding wall having an edge surface extending around the periphery of said opening;

a skylight assembly including a light transmitting member and a frame member, said frame member having a sealing surface adapted to be in abutting sealing engagement with a sealing member at the periphery of said opening, said frame member including first and second spaced clamping elements positioned so that the periphery of said light transmitting member is between said clamping elements, a plurality of pivot links spaced around the periphery of said light transmitting member each connected to said first and second elements, and clamp adjustment means coupled to one of said clamping elements and to said pivot links for squeezing said light transmitting member between said clamping elements;

a sealing member adapted to extend continuously around said opening between said edge surface of said upstanding wall and said frame member sealing surface; and

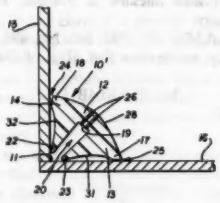


a skylight securing member secured to and depending from said frame member and adapted to be secured to said wall at a location interior to said skylight assembly.

4,520,605
DECORATIVE MOLDING FOR TUB OR COUNTER CAULKING

Richard W. Budd, 9785 Huntcliff Trace, Atlanta, Ga. 30338

Filed Sep. 27, 1982, Ser. No. 423,564
Int. Cl.³ E04F *19/04*
U.S. Cl. 52—287 4 Claims



1. A molding for protecting and sealing a joint formed by the angular intersection of two surfaces, comprising:

a first flexible, water-impervious elongate strip including a bottom edge and a top edge;

a second flexible water-impervious elongate strip including a bottom edge and a top edge;

a flexible, water-impervious intermediate elongate strip comprising an inner surface and a convex outer exposed surface, said intermediate strip joining said top edge of said first strip to said top edge of said second strip and forming an outer exposed surface of the molding;

said inner surface of said intermediate strip, said first strip and said second strip defining an elongate channel for receiving caulking; and,

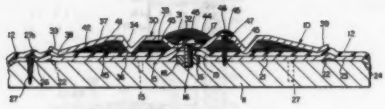
means defining a plurality of perforations in said intermediate strip extending between said outer exposed surface and said elongate channel for increasing the surface area of said channel for adhesion of caulking introduced into said channel, whereby caulking introduced into said channel for adhesion of said molding to said intersection appears at said outer exposed surface when said molding is affixed to said intersection.

4,520,606

ROOF MEMBRANE ANCHORING SYSTEMS USING DUAL ANCHOR PLATES

Thomas F. Francovitch, 6373 Windharp Way, Columbia, Md. 21045

Filed Jan. 27, 1983, Ser. No. 461,453
Int. Cl.³ E04B 2/08; E04D 3/36
U.S. Cl. 52—410 36 Claims



1. Roof membrane anchoring system structure for anchoring a water and moisture impervious membrane to a roof substrate comprising:

(a) upper and lower plates in superposed relationship, said lower plate on and engaging said substrate,

(b) a membrane between said plates,

(c) fastener means for holding the said lower plate to the roof substrate comprising at least one linear fastener extending into said substrate and directly securing only said lower plate thereto, and

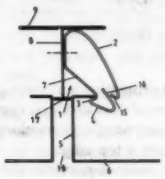
(d) means for compressively securing said upper plate against said membrane.

4,520,607

RELEASABLE RESILIENT MOUNTING ASSEMBLY FOR PANEL MEMBERS

Klaus Suckow, Biebesheim, Fed. Rep. of Germany, assignor to Stahlkonstruktionen Suckow & Fischer, Biebesheim, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,787
Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3219933
Int. Cl.³ E04B 5/52
U.S. Cl. 52—489 20 Claims



1. A mounting assembly for releasably supporting a panel member comprising:

a stationary support member to which said panel member is to be attached;

retaining clip means affixed to said support member adapted to releasably hold in place said panel member;

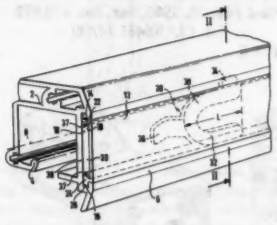
said retaining clip means comprising clasping spring means resiliently movable between an engaging position at which said panel member is releasably engaged therewith and a disengaged position for release of said panel member and a lock member adapted to engage said clasping spring means to hold said clasping spring means in said disengaged position during removal of said panel member and to release said clasping spring means prior to or during replacement of said panel member.

4,520,608

STRUCTURAL ASSEMBLY FOR SHOWER PARTITION OR THE LIKE

Heinz G. Baus, Wartbodenstrasse 35, CH-3626 Hünibach/-Thun, Switzerland

Filed Jun. 30, 1983, Ser. No. 509,864
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224716
Int. Cl.³ E04F 19/02
U.S. Cl. 52—718 17 Claims



1. A structural assembly comprising:

a support member having an elongated first channel defined by a first bottom web and first side flanges, said first side flanges forming opposed first grooves facing one another over said first web;

an elongated U-shaped panel member having a second channel defined by a second bottom web and second side flanges, said second side flanges being undercut by inwardly inclined inner surfaces forming dove-tail grooves facing one another over said web; said panel member being dimensioned for snuggly fitting into said first channel with said first and second webs in facing relation;

a connecting element having a resilient portion and outwardly inclined chamfered side edges fitting into said undercut dove-tail grooves whereby said connecting element is retained in said second channel between said first and second webs, said panel member and connecting element thereby forming an integrated panel assembly;

a first lateral projection formed on said resilient portion of said connecting element, and wherein one of said second side flanges is formed with a through slot for the resilient engagement thereacross of said first projection, said first projection having a length sufficient for reception thereof into one of said first grooves adjacent said one of said second side flanges, and

a second lateral projection on said panel assembly receivable in the other of said first grooves, whereby said panel assembly is removably secured in said first channel by said projections lodged in said first grooves, respectively.

4,520,609

GRID TEE FOR SUSPENSION CEILINGS OR THE LIKE

Robert F. Worley, Bay Village, and Jeffrey L. Petras, Avon Lake, both of Ohio, assignors to Donn Incorporated, Westlake, Ohio

Filed Sep. 27, 1982, Ser. No. 424,026
Int. Cl.³ E04B 5/52
U.S. Cl. 52—729 3 Claims

1. A grid tee for suspension ceilings comprising a thin strip of metal bent to form a generally planar central web, a bulb along one extremity of said web and oppositely extending panel supporting flanges along the opposite extremity of said web, said bulb having a lateral width substantially less than the total lateral width of said flanges, said strip of metal providing at least two reverse bends at the extremity of said bulb remote from said web, said reverse bends interconnecting at least three layers of said metal extending laterally with respect to said bulb at the extremity thereof remote from said web, said layers being in substantial face-to-face contact, said layers operating

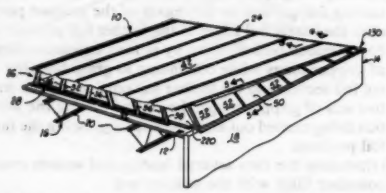
to concentrate metal at the bulb extremity of said tee to improve the strength and stiffness thereof to resist loads encountered when panels are supported on said flange, said metal providing substantially right angle bends at the ends of said layers so that said bulb provides spaced metal portions substantially parallel to said web on opposite sides thereof extending from said layers in the direction of said web, said substantially parallel metal portions on opposite sides of said web extending to inturned bends to provide inwardly extending metal portions extending to said web at the bulb extremity thereof thereby providing a hollow substantially closed bulb with multiple layers along the extremity thereof remote from said web, at least one of said inwardly extending metal portions being joined to said web, said metal being bent to provide four reverse bends with two reverse bends being opposite and substantially abutting, two of said layers being provided by separate substantially coplanar laterally extending metal portions.

4,520,610

METHOD FOR INSTALLING A ROOF SYSTEM POSITIONABLE OVER AN EXISTING ROOF STRUCTURE

Harold G. Simpson, Oklahoma City, and Leo E. Neyer, Edmond, both of Okla., assignors to Encon Products, Inc., Oklahoma City, Okla.

Filed Apr. 22, 1983, Ser. No. 487,614
Int. Cl.³ E04B *1/346*
U.S. Cl. 52—745 **7 Claims**



1. A method for reroofing a substantially flat existing roof of a structure so as to provide a new roof structure having a predetermined slope independent of the slope of the existing roof structure, the structure having a plurality of walls, each wall having an upper end portion, the method comprising the steps of:

securing an eave connector assembly to the upper end portion of one of the walls of the structure;

securing a lower cord of an adjustable ridge truss to the substantially flat existing roof such that the adjustable ridge truss is disposed at a location on the existing roof substantially corresponding to the ridge of the new roof structure and substantially parallel to the eave connector assembly, the adjustable ridge truss further characterized as having an upper cord and an adjustable web assembly disposed between and interconnecting the lower and upper cord;

adjusting the web assembly of the adjustable ridge truss so that the upper cord thereof is substantially horizontally disposed a predetermined distance above the lower cord and independent of the plane of the existing roof;

positioning at least one panel member across the upper cord of the adjustable ridge and the eave connector assembly such that the panel member is supported thereby; and

connecting the panel member to the upper cord of the adjustable ridge truss and the eave connector assembly to provide the new roof structure having a roof plane substantially independent of the roof plane of the substantially flat existing roof.

7. A method for reroofing a substantially flat existing roof of a structure so as to provide a new roof structure having a planar surface substantially independent of the planar surface of the existing roof, the method comprising the steps of:

securing a lower cord of a first adjustable eave truss to the flat existing roof, the first adjustable eave truss having an upper cord and an adjustable web assembly disposed between and interconnecting the lower and the upper cord;

adjusting the web assembly of the first adjustable eave truss so that the upper cord thereof is substantially horizontally disposed a first predetermined distance above the lower cord;

securing a lower cord of an adjustable ridge truss to the flat existing roof such that the adjustable ridge truss is disposed a selected distance from the first adjustable eave truss and substantially parallel thereto, the ridge truss being positioned in close proximity to the location of the ridge portion of the new roof structure, the adjustable ridge truss having an upper cord and an adjustable web assembly disposed and interconnecting the lower and upper cord;

adjusting the web assembly of the adjustable ridge truss so that the upper cord thereof is substantially horizontally disposed a second predetermined distance above the lower cord, the second predetermined distance being greater than the first predetermined distance between the upper cord and the lower cord of the first adjustable eave truss;

securing a lower cord of a second adjustable eave truss to the flat existing roof such that the second adjustable eave truss is disposed a selected distance from the adjustable ridge truss and parallel thereto, the second adjustable eave truss having an upper cord and an adjustable web assembly disposed between and interconnecting the lower and upper cord;

adjusting the web assembly of the second adjustable eave truss so that the upper cord thereof is substantially horizontally disposed a third predetermined distance above the lower cord, the third predetermined distance being less than the second predetermined distance between the upper cord and the lower cord of the adjustable ridge truss;

positioning panel members on the upper cords of the first adjustable eave truss, the adjustable ridge truss and the second adjustable eave truss such that the panel members are supported thereby; and

connecting the panel member to the upper cords of the adjustable trusses to provide the roof structure.

4,520,611

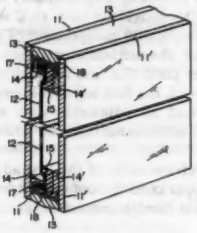
STRUCTURE OF MULTILAYERED UNIT FOR WINDOWS

Tadashi Shingu, Hino; Tadakazu Tsutada, Hachioji; Toshio Nishihara, and Nobuo Suzuki, both of Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 235,548, Feb. 18, 1981, abandoned.
This application Oct. 17, 1983, Ser. No. 541,474
Claims priority, application Japan, Feb. 20, 1980; 55-19055; Feb. 20, 1980, 55-19056; Mar. 6, 1980, 55-27300
Int. Cl.³ E04C *2/54*
U.S. Cl. 52—789 **12 Claims**

1. The structure of a multilayered unit for windows, com-

prising a plurality of planar members; at least one flexible film disposed therebetween and spaced from two of the planar members; spacers solely defining the clearance between opposing planar members; and a sealing member for sealing the spaces defined by the planar members at substantially their entire peripheral edge portions said flexible film extending at least over that region of said planar members which forms a window, and the planar members present on at least one side of the flexible film being transparent or semi-transparent, characterized in that the structure includes a resilent stretching member separate from said spacers for stretching the flexible film taut by imparting thereto a force having at least a vector component thereof acting at right angles to the plane of the film, so as to tend to push said film away from said stretching member, each of the spacers opposing each other on each side of said film having a space formed therein which faces the flexible film and further wherein the stretching member is located in at least one of said spaces and is substantially shielded from sunlight by at least one of said spacers.



4,520,612

PACKAGING MACHINE

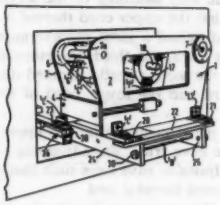
Rolf Muller, Longuich/Mosel, Fed. Rep. of Germany, assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 31, 1983, Ser. No. 462,163

Claims priority, application United Kingdom, Jan. 15, 1982, 8201078

Int. Cl.³ B56B *11/10*

U.S. Cl. 53—48 **4 Claims**



1. In a packaging machine for applying a wrapper to a group of articles whereby overlapping portions of the wrapper are tightened and secured together by tightening and locking elements, a removable locking unit mounted in the machine on transversely extending guide rails so that it can be withdrawn as a unit transversely of the machine from a first operative position within the machine frame to a second non-operative position clear of the machine frame, said unit comprising a housing which contains said tightening and locking elements arranged in operative relationship, runner plates supporting said housing and slidingly engaging said guide rails, a releasable drive coupling for engaging drive means of the machine when said locking unit is in said first operative position so that drive is transmitted to said tightening and locking elements and for automatically disengaging said drive means of the machine when the locking unit is withdrawn to said second non-operative position so that drive to said tightening and locking elements is disconnected, and releasable locking means for securing said locking unit in said first operative position.

4,520,613

METHOD AND MACHINE FOR THE PACKAGING OF ARTICLES WITH A STRETCHABLE FOIL

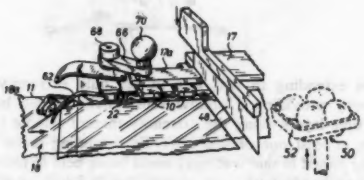
Fuzzi Claudio, Lugano, Switzerland, assignor to Eurobeva Engineering Trust, Lugano, Switzerland

Filed Jul. 20, 1981, Ser. No. 285,059

Claims priority, application Switzerland, Jul. 18, 1980, 5506/80

Int. Cl.³ B65B *41/14, 41/04*

U.S. Cl. 53—441 **13 Claims**



1. Method for packaging of articles, especially fruit, vegetables or meat, placed in a dish-like container comprising

(1) grasping two lateral edges of a leading foil portion, projecting from a roll, by a first set of at least two gripper tongs, positioned transversely—with respect to the longitudinal extent of a foil—said at least two gripper tongs being part of a plurality of sets of movable gripper tongs arranged, with spacing, from one another;

(2) intermittently transporting the gripper tongs over the dish-like containter and drawing off the foil from the roll;

(3)grasping further foil portions downstream of the leading foil portion, subsequent to the first grasped foil portion, by succeeding sets of gripper tongs;

(4) cutting off and severing a leading foil section from the leading foil portion in the region of the grasped portions after the lateral foil edges of the further foil portions have been grasped on both sides by at least one succeeding set of gripper tongs while continuing to grasp both the leading foil section and the further foil portions by the respective sets of gripper tongs, the step of cutting the foil section being carried out after the step of grasping the further foil portions;

(5) stretching the then severed leading foil section over the container filled with the articles; and

(6) releasing the grasp of the gripper tongs on the foil section to permit folding the foil edges around the underside of the container.

4,520,614

APPARATUS FOR INTRODUCING STACKS OF PAPER SHEETS OR THE LIKE INTO CARTONS

Kurt Aykut, deceased, late of Hamburg, Fed. Rep. of Germany; by Eva-Marie Aykut, executor, Barmbeker Str. 177, D-2000 Hamburg 60, Fed. Rep. of Germany, and Wolfram Wolf, Holsteinhausstr. 1, D-2081 Bilsen, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,732

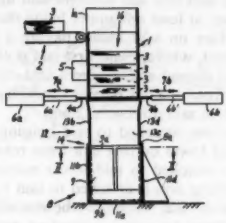
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208388

Int. Cl.³ B65B *35/52*

U.S. Cl. 53—540 **11 Claims**

11. Apparatus for introducing stacks of paper sheets or the like into open-top cartons having side walls which tend to bulge outwardly in response to a rise of air pressure in the cartons, comprising an open-top receptacle defining a chamber

for reception of cartons in such orientation that the open top of the carton in the chamber faces upwardly, said receptacle having a side wall movable to and from an open position in which a carton is insertable into and removable from said chamber; a duct extending upwardly from the open top of said receptacle and having a cross-sectional area at least substantially matching the format of the stack which is to be introduced into the carton in the receptacle below the duct; and means for feeding stacks into said duct whereby a stack which descends in said duct compresses the air therebelow and causes the thus compressed air to urge the side walls of the carton in said chamber against said receptacle.

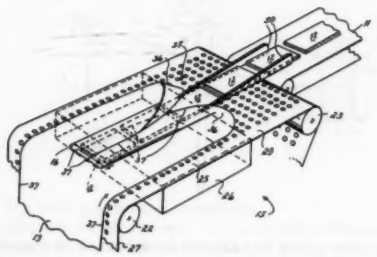


4,520,615

TUBE FORMING APPARATUS FOR PACKAGING

Peter B. Engler, River Falls, and Stanley D. Denker, New Richmond, both of Wis., assignors to Doboy Packaging Machinery, Inc., New Richmond, Wis.

Filed Feb. 28, 1983, Ser. No. 470,194
Int. Cl.³ B65B *9/06, 9/10*
U.S. Cl. 53—550 **6 Claims**



1. Apparatus for making a packaging tube from a web of paper or film comprising:

an endless, perforated belt having a flat run;

means driving said belt through said flat run in a first direction;

vacuum box means having an upstream and downstream end for applying a vacuum to the underside of said flat run;

means for continuously supplying said web to the flat run of said perforated belt to pull said web in said first direction toward said downstream end;

rotary web-engaging means disposed proximate said upstream end for withdrawing said web from said flat run by drawing said web in a direction opposite to said first direction;

said web being folded to flow in said opposite direction and to turn the side edges of said web inwardly upon itself, continuously forming a tube moving in said opposite direction without use of an intervening edge member for defining fold lines;

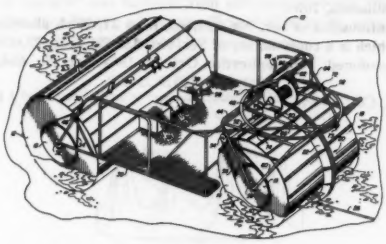
said vacuum box means being positioned at the location where said web is folded to flow in the opposite direction to form said tube.

4,520,616

METHOD AND SYSTEM FOR CONDITIONING AND REMOVING AQUATIC PLANTS

E. Allen Stewart, Cassadaga, and Evan L. Keesling, Lake Helen, both of Fla., assignors to Amasek, Inc., Cocoa, Fla.

Filed Sep. 16, 1983, Ser. No. 533,012
Int. Cl.³ A01D *44/00*
U.S. Cl. 56—9 **23 Claims**



1. A method for conditioning aquatic plants growing on the surface of a body of water, said method comprising the steps of:

(a) providing a water craft having a rotatable drum, the specific density of said drum being substantially less than 1, whereby said drum floats on top of a body of water;

(b) fitting said drum with conditioning ribs extending away from the surface thereof;

(c) moving said craft across an area of compacted growth of surface-growing aquatic plants;

(d) rotating said drum so that said ribs separate and condition said growth of plants for a relatively uniform distribution across the surface of said body of water; and

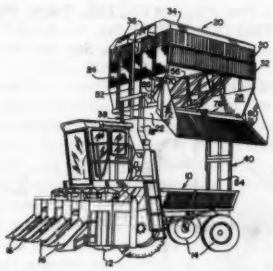
(e) removing said plants from said body of water after said separating and conditioning step.

4,520,617

COTTON HARVESTER

Robert M. Fachini, Naperville; Monroe C. Barrett, Downers Grove, and Maxwell D. McClure, III, Naperville, all of Ill., assignors to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 338,191, Jan. 11, 1982,. This application Jul. 19, 1983, Ser. No. 515,330
Int. Cl.³ A01D *46/08*
U.S. Cl. 56—16.6 **16 Claims**



1. In a cotton harvester having a wheeled chassis, a picking unit for harvesting cotton, a conveyor operably connected to the picking unit, and a unitary basket having a floor and up-

wardly extending walls for collecting cotton from the conveyor, the combination of means for raising the basket in a constant angle position to a cotton discharge position, means for discharging cotton from the basket in a controllable fashion while the basket remains in the same constant angle position, and control means for opening and closing said basket regardless of said basket elevation and speed of dischargeable cotton.

4,520,618

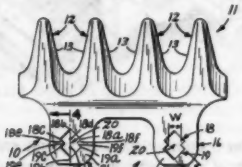
CUTTER GUARD

Wayne E. Sorensen, West Des Moines, and Larry E. Johnson, Indianola, both of Iowa, assignors to Herschel Corporation, Indianola, Iowa

Continuation of Ser. No. 612,665, May 21, 1984, abandoned, which is a continuation of Ser. No. 425,688, Sep. 28, 1982, abandoned. This application Oct. 23, 1984, Ser. No. 664,086

Int. Cl.³ A01D *55/10*

U.S. Cl. 56—310 **1 Claim**



1. A guard for a cutter bar of a harvesting machine, the guard having a leading prong section, and a trailing section for attachment with a bolt having a square portion to the cutter bar, said trailing section including a pair of spaced-apart, outwardly extending members, each of said members having a longitudinal axis, wherein the improvement comprises means at said trailing section for positioning said guard in either a first position or a second position on the machine cutter bar, said positioning means including a central portion on each of said members containing a forward opening and a rearward opening aligned with respect to each other, each of said respective openings of said members being substantially square in shape and having a center point and at least one corner located on said respective extending member axis, each opening including an area overlapping a like area of said other opening, said overlapping area defining a reduced passage to prevent said bolt from inadvertently moving from one of said first and second position to the other.

4,520,619

LAWN MOWER

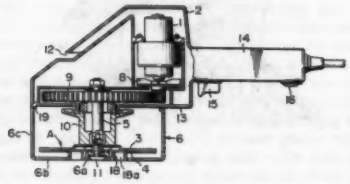
Hachiro Doi, and Masayuki Yaegashi, both of Saitama, Japan, assignors to Fuso Keigokin Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1982, Ser. No. 454,328

Claims priority, application Japan, Sep. 25, 1982, 57-167839

Int. Cl.³ A01D *67/00, 55/00*

U.S. Cl. 56—320.1 **17 Claims**



1. A lawn mower comprising:

a housing;

a cutter unit including:

(a) a lower cutting unit below said housing and having at least one lower blade attached thereon; and

(b) an upper cutting unit below said housing and coaxial with said lower cutting unit around an axis, wherein said upper cutting unit is adapted to rotate in a direction t around said axis and wherein said upper cutting unit comprises: at least one upper blade thereon, and a cutting surface on said blade, having a first end and a second end, wherein said first end is closer to said axis than said second end, wherein said cutting surface extends in front of a line passing through said axis and said first end, in said direction t,; and

a supporting arm, attached to said housing and adapted to prevent said lower cutting unit from rotating; and

a fixed shaft, attached to said lower cutting unit, wherein said supporting arm is attached to said fixed shaft and to the bottom of said housing, wherein said upper cutting unit is adapted to rotate around an axis, wherein said supporting arm and said lower cutting unit are adapted to rotate through ninety degrees around said axis, and then become rigidly attached to said fixed shaft.

4,520,620

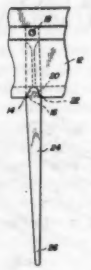
HARVESTER REEL PICKUP TINE

James M. Gessel, La Moille; Gary L. Kunz, and E. Louis Scheidenhelm, both of Mendota, all of Ill., assignors to Hart-Carter Company, Minneapolis, Minn.

Filed Sep. 27, 1984, Ser. No. 655,163

Int. Cl.³ A01D *57/02*

U.S. Cl. 56—400 **2 Claims**



1. A crop pickup tine adapted for mounting on a harvester reel bat and having a bat attachment portion at its upper end and a pickup finger portion of predetermined length extending from the bat attachment portion, the finger portion of the tine having a constant thickness in the front-to-rear direction from adjacent its upper end to more than half the finger length and then decreasing progressively to the finger tip, and the finger width of the tine decreasing progressively from substantially twice its thickness at the said upper end to less than its thickness at the finger tip.

4,520,621

GARDENING TOOL

Gene R. Archer, 8225 Gale Rd., Rte. 1, Hebron, Ohio 43025

Filed Aug. 25, 1983, Ser. No. 526,271

The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.³ A01D *7/00*

U.S. Cl. 56—400.11 **12 Claims**

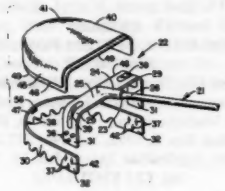
1. A garden tool, comprising:

a. a handle; and

b. a rake element including;

i. a bridge portion centrally connected to one end of the

handle, the bridge portion including a plurality of flex portions extending transversely and laterally on opposite sides of the handle, the bridge portions terminating and joined to ends depending or extending at an angle downward,



ii. a comb element joined on the sides of the ends of the flex portions and,

iii. the gage of the rake element being sufficiently thin that the tool is characterized by an elastic response when applied to a work surface.

4,520,622

STRANDING DEVICE

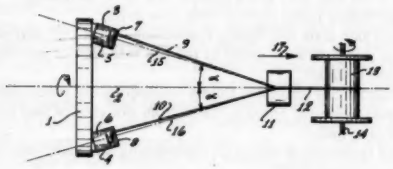
Gerhard Ziemek; Friedrich Schatz, and Hermann Meyer, all of Langenhagen, Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,637

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221369

Int. Cl.³ D07B 3/06

U.S. Cl. 57—59 **5 Claims**



1. A stranding apparatus, comprising:

at least one carrier element, having an axis and being provided for rotation about the axis;

a plurality of coil containers arranged on said carrier and mounted thereto at an angle of their respective axes in relation to said axis of rotation so that coils of stranding elements contained in the containers have axes of like orientation, said angle being an acute one and oriented in relation opposite to a direction of withdrawing of the stranding material of the coils;

a stranding nipple arranged in at least approximately an intersection of said axis of the containers with the axes of rotation and provided for combining the stranding material as withdrawn from said coils along the said inclined axis;

takeup means disposed downstream from said stranding nipple for receiving and winding stranded together stranding elements; and

said angle being selected to be dependent upon the speed of rotation of the carrier, the distance of the coils from said axis of rotation and the friction between the coils and the respective container such that the angle is smaller for a higher speed and/or a larger value of said distance, but larger with higher friction, the angle being not smaller than 5 degrees and not larger than 30 degrees.

4,520,623

ACTIVATED CARBON FIBER SPUN YARN

Hiroyasu Ogawa; Kazuo Izumi, and Kenji Shimazaki, all of Shizuoka, Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 514,898

Claims priority, application Japan, Jul. 17, 1982, 57-123784

Int. Cl.³ D02G 3/02

U.S. Cl. 57—236 **14 Claims**

1. An activated carbon fiber spun yarn comprising activated carbon fibers having a specific surface area of 500 to 1,500 m^2/g, a ductility of at least 0.5%, and a tensile strength of at least 10 kg/mm^2 and derived from acrylonitrile-based fibers, said spun yarn having a twist coefficient of 30 to 60, wherein the twist coefficient is defined by the equation:

$$\text{twist coefficient} = \frac{\text{twist number per meter}}{\sqrt{\text{metric count of spun yarn}}}$$

4,520,624

DIESEL PARTICULATE FILTER SYSTEM

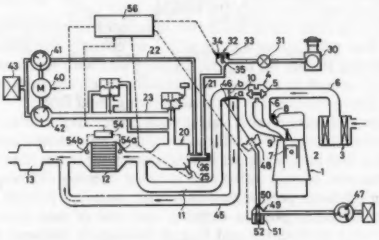
Yuhiko Kiyota; Katsuyuki Tsuji; Satoru Kume, all of Kyoto; Hiroaki Takada; Kiyoichi Shinsei, both of Hyogo; Akio Matsumoto, and Hitoshi Ogawa, both of Hyogo, all of Japan, assignors to Mitsubishi Jiboshia Kogyo Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha, both of, Japan

Filed Jul. 12, 1984, Ser. No. 630,054

Claims priority, application Japan, Jul. 15, 1983, 58-128779

Int. Cl.³ F01N 3/02

U.S. Cl. 60—286 **10 Claims**



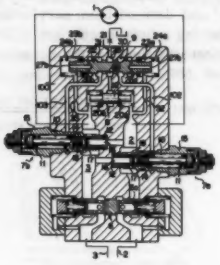
1. A system for trapping diesel particles, comprising: an exhaust gas line extending from an exhaust port of a diesel engine; a particulate filter connected in said exhaust gas line; ignition means; a burner connected at a point upstream of said particulate filter and which is supplied with fuel, a primary air flow for atomizing said fuel and a secondary air flow for burning particulates trapped in said particulate filter and which supplies said particulate filter with a hot burning gas produced by said ignition means; primary and secondary air pumps for supplying said primary air and secondary air flows, respectively; a single motor for driving both said primary and secondary air pumps; and means for controlling said ignition means and said motor such that said filter; when it has trapped particulates in an amount exceeding a preset level, is cleaned by burning said particulates in said burner.

4,520,625

HYDRAULIC BRAKE VALVE SYSTEM

Hideyori Sato, Funabashi; Nobuaki Inaba, Yokohama; Mitsuru Arai, Kamakura, and Michio Onzou, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 2, 1983, Ser. No. 471,341
Claims priority, application Japan, Mar. 4, 1982, 57-029613; Mar. 4, 1982, 57-029614
Int. Cl.³ F16D 31/02
U.S. Cl. 60—464 2 Claims



1. A hydraulic brake valve system installed in a hydraulic fluid circuit wherein a hydraulic motor is connected with a manually operated directional control valve through a driving fluid line of the circuit and a braking fluid line, characterized in that said system comprises:

(a) a counterbalance valve connected between the driving fluid line and the braking fluid line and actuated by pressure differential between them;

(b) a first relief valve having two pressure receiving surfaces therearound for relieving the pressurized fluid acting on one of said pressure receiving surfaces at a low pressure and for relieving the pressurized fluid acting on the other of said pressure receiving surfaces at a high pressure, said first relief valve having a back pressure chamber to block the relieving operation which is arranged to connect the pressure receiving surface on the low pressure side with the driving fluid line and to connect the pressure receiving surface on the high pressure side with the braking fluid line;

(c) a second relief valve having the same construction as that of the first relief valve and arranged to connect the pressure receiving surface on the low pressure side with said braking fluid line and to connect the pressure receiving surface on the high pressure side with said driving fluid line;

said first and second relief valves each comprising a valve seat member having an axially extending bore communicating with a first port; a poppet having a diameter larger than that of the seat of said valve seat member thereby defining an inner diameter portion and an outside diameter portion, the inner diameter portion defining said one of said pressure receiving surface, the end face of the outside diameter portion of said poppet being located oppositely to a second port and defining the other of said pressure receiving surfaces; and a spring located to urge said poppet from the rear surface thereof towards said valve seat member, the arrangement being made such that if the area of the poppet to receive the pressurized fluid from the first port is defined as A_1 and that of the poppet to receive the pressurized fluid from the second port as A_2, then a relationship of $A_1 < A_2$ is obtained; the rear surface of said poppet facing said back pressure chamber and being located oppositely to a third port;

(d) a drain change-over valve means actuated by the pressure differential between the driving fluid line and the braking fluid line for connecting either one of said fluid lines which is kept at a low pressure with a drain passage; and

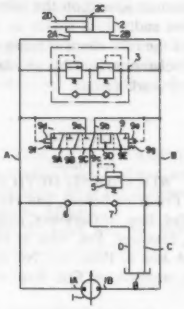
(e) timer valve means actuated by the pressure differential between the driving fluid line and the braking fluid line for supplying with a time lag the pressurized fluid within either one of said fluid lines which is kept at a high pressure into the back pressure chamber of the relief valve whose pressure receiving surface on the low pressure side is connected with said fluid line kept at a high pressure.

4,520,626

HYDRAULIC DRIVE SYSTEM FOR SINGLE ROD CYLINDER

Kichio Nakajima; Eiki Izumi; Hiroshi Watanabe; Yukio Aoyagi, and Kazuo Honma, all of Ibaraki, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1982, Ser. No. 337,283
Claims priority, application Japan, Jan. 10, 1981, 56-1614
Int. Cl.³ F16D 31/02
U.S. Cl. 60—468 3 Claims



1. A hydraulic drive system for a single rod cylinder formed with a rod side port and a bottom side port, including:

a hydraulic pump formed with two ports;

a rod side main line fluidly connecting one of said two ports of said hydraulic pump to the rod side port of said single rod cylinder;

a bottom side main line fluidly connecting the other port of said hydraulic pump to the bottom side port of said single rod cylinder;

fluid replenishing means for replenishing said main lines with a working fluid;

a flushing valve formed with two inlet ports respectively connected to said two main lines and one outlet port for communicating the inlet port of a lower pressure with said one outlet port; and

a low pressure line connecting said outlet port of said flushing valve to a fluid tank;

characterized in that said flushing valve is displaceable between a normal position and first and second switching positions while maintaining communication between at least one of the inlet ports and the outlet port, said flushing valve is located in the normal position when the hydraulic pump is stopped so that one of the inlet ports is communicated with the outlet port, said flushing valve is displaced from the normal position when the hydraulic pump is actuated to the first switching position in which one inlet port is communicated with the outlet port and to the second switching position in which the other inlet port is communicated with the outlet port so that said rod cylinder is held at a stopped position against an external force being applied thereto by means of said flushing valve, and in that a pressure means is mounted in said low pressure line wherein said low pressure line is located in a path communicating one of the main lines to the fluid tank, for causing an increase in pressure in the main line connected to the inlet port communicated with the outlet port when the flushing valve is in the normal position to displace the flushing valve to one of the switching positions, whereby

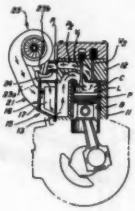
said flushing valve drains excess fluid from said main line of a lower pressure.

4,520,627

TURBOCHARGED INTERNAL COMBUSTION ENGINE

Dean H. Reichenbach; John H. Stang, both of Columbus; Lewis W. Cummings, New Whiteland; Richard E. Glasson, and David A. Ruthmansdorfer, both of Columbus, all of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Aug. 9, 1983, Ser. No. 521,625
Int. Cl.³ F02F *1/42*
U.S. Cl. 60—599 **7 Claims**



1. A turbocharged internal combustion engine comprising a block provided with a plurality of cylinders and an elongated cavity formed on one side of said block and extending the length of said block and having an opening thereto on the exterior of said one side; a head mounted on said block in overlying relation with the corresponding end of each cylinder, said head being provided with an internal intake passageway and an internal exhaust passageway for each cylinder, one end of each intake passageway communicating with said cavity and one end of each exhaust passageway terminating at the exterior of said head adjacent said block one side and in proximity to said cavity opening; an elongated heat exchange assembly disposed adjacent said cavity opening and extending the length of said cavity and having a housing mounted on the exterior of said block one side in overlying relation with said cavity opening, said housing having an inlet and an outlet spaced therefrom, and a heat transfer means disposed within said housing intermediate said inlet and outlet and extending the length of said housing, said housing outlet extending the length of said cavity opening and communicating with said cavity opening; and a turbocharger disposed adjacent the exterior of said block one side and having an exhaust gas intake communicating with the terminating one end of each exhaust passageway of said head and a charged air outlet communicating with the housing inlet whereby the change air flow within said housing must pass said heat transfer means before exiting into said cavity; said turbocharger, said head exchange assembly, and the corresponding one ends of said exhaust gas passageways being in close proximity to said cavity.

4,520,628

METHOD FOR COMPRESSING AND HEATING A HEATING MEDIUM TO BE EXTERNALLY SUPPLIED TO AN ENGINE WHILE USING THE ENERGY AVAILABLE IN THE HOT EXHAUST GASES OF THE ENGINE

Stig G. Carlqvist, Malmö, Sweden, assignor to Stig G. Carlqvist Motor Consultant (CMC) AB, Malmö, Sweden

Continuation of Ser. No. 421,719, Sep. 22, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 633,069
Claims priority, application Sweden, Oct. 22, 1981, 8106246
Int. Cl.³ F01K *23/06*; F02B *33/44*
U.S. Cl. 60—616 **9 Claims**

1. A compound engine system comprising

a heat-producing unit which receives air and exhausts a heated gaseous medium,

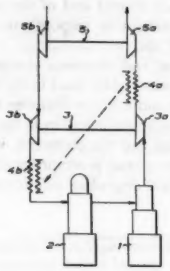
an engine which receives the gaseous medium from the heat-producing unit for externally heating the engine,

a first compression stage for compressing air for said heat-producing unit,

a second compression stage for receiving and compressing the air from the first compression stage,

a first expansion stage for receiving exhaust gases from the engine,

a second expansion stage for receiving exhaust gases from said first expansion stage,



said first compression stage and said second expansion stage being mechanically interconnected,

said second compression stage and said first expansion stage being mechanically interconnected,

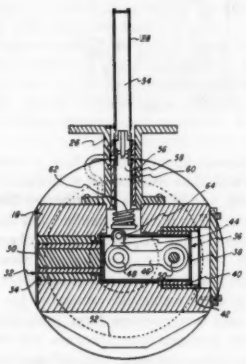
a heat exchanger interposed between the first expansion stage and the second expansion stage and between the second compression stage and the heat producing unit such that heat is transferred between the exhaust gases passing from the first expansion stage to the second expansion stage and the air passing from the second compression stage to the heat producing unit.

4,520,629

DRIVE MECHANISM FOR A REFRIGERATOR WITH CLEARANCE SEALS

Robert M. Dix, Dallas; Timothy A. Ellis, Plano, and Gary W. Andrews, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 26, 1983, Ser. No. 526,851
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **13 Claims**



1. A cryogenic refrigerator comprising:

(a) a housing,

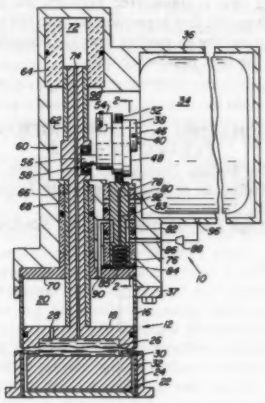
(b) a cold finger means operatively connected to the housing, said cold finger means including a regenerator/displacer;
(c) a motor connected to the housing;
(d) a crankshaft operatively connected to the motor;
(e) a connecting rod having first and second end portions, said first end portion operatively connected to the crankshaft and to the regenerator/displacer of the cold finger;
(f) a piston guide means having a guide member rigidly fixed to the housing, a hollow body member having a portion thereof mounted in said guide member, said hollow body journalled to the second end of the connecting rod for reciprocal movement in response to movement of the connecting rod; and
(g) a clearance seal, said clearance seal including a cryogen compression piston rigidly fixed to the hollow body of the cylinder means and a sleeve member ridigly fixed to the housing in a spaced relationship to the piston to form an elongated sealing gap therebetween, whereby said cryogen compression piston is reciprocated substantially free of a clearance seal degrading side force vector.

4,520,630

CRYOGENIC REFRIGERATOR AND HEAT SOURCE

Domenico S. Sarcia, Carlisle, Mass., assignor to CVI Incorporated, Hilliard, Ohio

Filed Mar. 6, 1984, Ser. No. 586,575
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **12 Claims**



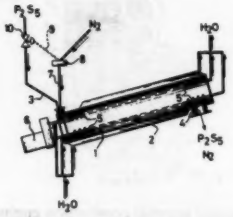
1. In a cryogenic apparatus in which a movable displacer means defines within an enclosure first and second chambers of variable volume, and in which a refrigerant fluid is circulated in a fluid path between the first chamber and the second chamber by movement of the displacer means, chamber means for guiding a slide connected to the displacer means, a reversible motor connected to said slide for reciprocating said slide, a valve having a reciprocable valve member for controlling the flow of high and low pressure fluid, said motor being connected to a cam arranged to reciprocate said valve member in timed relation with reciprocation of said slide so that the valve member will introduce high pressure fluid into said first and second chambers when the displacer means is at each of the extremities of its movement so that the apparatus is either a refrigerator or heat pump.

4,520,631

METHOD FOR CONTROLLING AND OPTIONALLY REGULATING THE LEVEL OF LIQUID P_2S_5 IN A COOLING DEVICE

Günter Reichert, Bornheim-Merten; Franz Mainzer, Hürth; Kurt Lehmann, and Hermann Niermann, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 446,777, Dec. 3, 1982, abandoned, which is a division of Ser. No. 235,050, Feb. 17, 1981, Pat. No. 4,386,503. This application May 14, 1984, Ser. No. 609,518
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006625
Int. Cl.³ F25D *17/02*; G01F *23/00*
U.S. Cl. 62—188 **3 Claims**



1. A method for measuring and controlling the level of P_2S_5 in a cooling apparatus for solidifying molten liquid P_2S_5 comprising: introducing molten liquid P_2S_5 through a P_2S_5-feed inlet into the lower end portion of the cooling apparatus which is in an inclined position, cooling and solidifying the molten liquid P_2S_5 within the cooling apparatus, and discharging completely solidified P_2S_5 by a screw conveyer through an outlet at the upper end portion of the said cooling apparatus; introducing an inert gas into said lower end portion of the cooling apparatus through an inlet opening thereinto, said inert gas inlet being positioned in the immediate neighborhood of the liquid P_2S_5 inlet so as to terminate above the wall of the cooling apparatus at a level which lies between the axis and lower edge of the screw conveyor; bubbling the inert gas through the P_2S_5, measuring the pressure difference which is established in accordance with the P_2S_5 level in the apparatus, thereby obtaining measurements relating to the level of P_2S_5 in the cooling apparatus; and controlling the level of P_2S_5 in the cooling apparatus by utilizing said measurements.

4,520,632

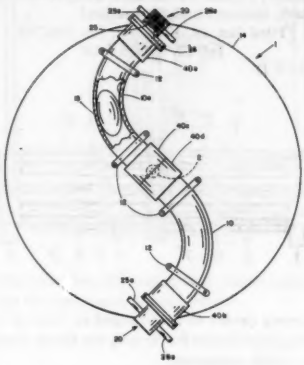
METHOD AND APPARATUS FOR EXTRACTING HEAT AND MECHANICAL ENERGY FROM A PRESSURED GAS

Edwin W. Dibrell, San Antonio, Tex., assignor to Centrifugal Piston Expander, Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 436,852, Oct. 25, 1982, abandoned. This application Aug. 19, 1983, Ser. No. 524,281
Int. Cl.³ F25D *9/00*
U.S. Cl. 62—403 **44 Claims**

1. Apparatus for extracting heat and mechanical energy from a pressured gas comprising, in combination, a rotatable body; power means for rotating said body about a first axis; a cylinder means defining an elongated fluid pressure chamber having a generally S-shaped longitudinal axis; means for rigidly mounting said cylinder means on said body with the ends of said fluid pressure chamber disposed on opposite sides of said first axis and radially remote therefrom, and the central portions of said fluid pressure chamber proximate to said first axis; said fluid pressure chamber having a uniform cross-section throughout its length; a free piston mounted in said fluid pressure chamber for sliding sealable movement throughout the S-shaped length thereof, first and second valve means for respectively supplying pressured gas to the ends of said fluid

pressure chamber; third and fourth valve means for respectively exhausting expanded gas from the ends of said fluid pressure chamber; and a plurality of piston detecting means spaced along the length of said cylinder means and operatively



connected to said first, second, third, and fourth valve means to cause said piston to continuously reciprocate from one end to the other of said fluid pressure chamber as said body is rotated.

4,520,633

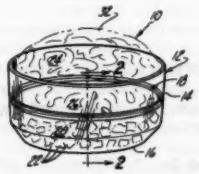
SALAD BOWL

Roberta L. Hoydic, 5035 Highwood Dr., Flint, Mich. 48504

Continuation-in-part of Ser. No. 405,512, Aug. 5, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 602,262

Int. Cl.³ F25D *3/08*

U.S. Cl. 62—457 **7 Claims**



1. A receptacle comprising:

a wall having an inner dimension;

a substantially planar lid having an outer dimension substantially the same as said inner dimension of said wall;

a bottom affixed to one end of said wall;

means for detachably lockingly securing said lid to said wall located at a point between said bottom and the top of said wall, said lid securing means defining an upper wall portion and a lower wall portion;

wherein said lower wall portion, said bottom and said lid define a chamber in said receptacle and wherein said lid and said upper wall portion define an open receptacle portion; and

means for detaching said lid from said wall secured to said lid.

4,520,634

MULTI-STAGE ABSORPTION REFRIGERATION SYSTEM

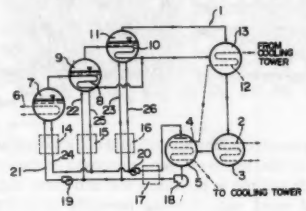
Tomihisa Oouchi; Sampei Usui; Tamio Fukuda, and Akira Nishiguchi, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,482

Claims priority, application Japan, Apr. 13, 1983, 58-63596

Int. Cl.³ F25B *15/00*

U.S. Cl. 62—476 **10 Claims**



1. A multi-stage absorption refrigeration system comprising;

a first generator equipped with a heating source for heating a solution to vaporize a refrigerant therein and produce a gas refrigerant;

means conveying said gas refrigerant produced in said first generator to a second generator utilizing the gas refrigerant produced in said first generator as a heating source for heating the solution to vaporize refrigerant therein and produce gas refrigerant;

means conveying said gas refrigerant produced in said second generator to a third generator utilizing the gas refrigerant produced in said second generator as a heating source for heating the solution to vaporize refrigerant therein and produce gas refrigerant;

condenser means for cooling the gas refrigerant produced in the first generator and second generator and used for heating the solution in the next following generator and the gas refrigerant produced in the third generator, to produce liquid refrigerant;

evaporator means vaporizing the liquid refrigerant produced in the condenser means to thereby cool a medium to be cooled while producing gas refrigerant;

absorber means causing the gas refrigerant produced in said evaporator means to be absorbed in a concentrated solution produced in each said generator to produce a dilute solution;

a solution supply system for supplying the dilute solution produced in said absorber means directly to each said generator without passing through another generator;

pump means for supplying the dilute solution to each said generator through said solution supply system;

heat exchanger means comprising a plurality of heat exchangers each for causing heat exchange to take place between the solutions going into and coming from each generator; and

a cooling medium flow system causing the cooling medium to flow first through the condenser means and then through the absorber means.

4,520,635

CUSHION FOOT SOCK

Harper Shields, and Roger D. Lineberry, both of Burlington, N.C., assignors to Kayser-Roth Hosiery, Inc., Burlington, N.C.

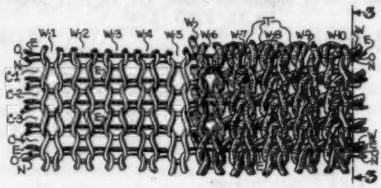
Filed May 29, 1984, Ser. No. 614,775

Int. Cl.³ A41B *11/02;* **D04B** *9/46*

U.S. Cl. 66—185 **10 Claims**

1. An improved cushion foot sock including a leg, and a foot with a heel, an instep, a sole, and a toe knit of a body yarn, the

improvement comprising an elastic yarn incorporated in spaced-apart wales and floating inside of multiple wales of successive courses of said leg and said instep and forming mock ribs therein, said elastic yarn being incorporated in every other wale in said sole to provide stretchability and to maintain said sole in close engagement with the foot of the wearer, and wool



yarn knit in plated relationship with said body yarn in said heel, sole and toe so that said wool yarn is exposed on the outside of said heel, sole and toe to provide a soft and fuzzy appearance thereto, said wool yarn forming inwardly extending terry loops in said heel, sole and toe to provide a soft cushion and good moisture characteristics thereto.

4,520,636

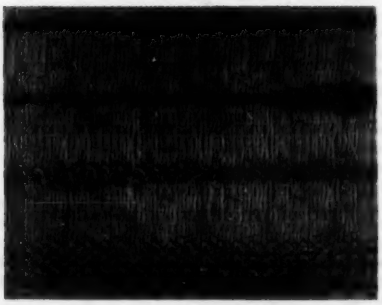
WOVEN-LIKE WARP KNIT FABRIC WITH TENSION CONTROL FOR TOP EFFECT YARN

Julius R. Schnegg, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 97,972, Nov. 28, 1979, Pat. No. 4,395,889. This application Aug. 31, 1981, Ser. No. 297,963

Int. Cl.³ D04B *23/08*

U.S. Cl. 66—192 **32 Claims**



1. A warp knit fabric having woven-like characteristics comprised of a plurality of chain stitches extending in the machine direction of the fabric, a plurality of weft yarns extending in the cross-machine direction and at least one top effect yarn laid into at least one of said chain stitches, said top effect yarn being a non-slubbed yarn and being bunched at random intervals in dependence upon varied tension of the top effect yarn along the machine direction, said top effect yarn exhibiting the appearance of ratine-like slub effect yarn due to the varied tension thereof.

4,520,637

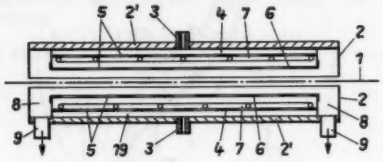
STEAMING DEVICE ARRANGED IN FRONT OF A SYNTHETIC FIBER CRIMPING INSTALLATION FOR HEATING FIBERS TRAVELING PAST SUCH STEAMING DEVICE

Heinz Fleissner, Riehen, Switzerland, assignor to Vepa Aktiengesellschaft, Riehen/Basel, Switzerland

Filed Jan. 10, 1983, Ser. No. 456,764

Int. Cl.³ D06B *5/04*

U.S. Cl. 68—5 D **6 Claims**



1. A steaming device to be arranged in front of a synthetic fiber crimping installation for heating the fibers travelling past the device, which comprises:

a steaming duct extending over an operating width of the device;

means for feeding steam to the duct including a pipe having a discharge opening leading to the duct;

means for shielding the opening with respect to the fibers travelling past the device, said shielding means including a first steam permeable distributor panel that extends over the length of the duct and that is arranged at a spacing with respect to an insulated duct wall in order to form a distributor channel, the first distributor panel being partially perforated with spaced openings and having an imperforate area opposite to the steam feed pipe, a second steam permeable distributor panel arranged in superposition and at a mutual spacing from the first distributor panel, the openings of the first distributor panel being laterally offset with respect to openings in the sound distributor panel; and

a heater for heating the steam extending over the width of the steaming duct between the two distributor panels.

4,520,638

TRIPLE ACTION AGITATOR FOR AUTOMATIC WASHERS

Robert A. Brenner, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 7, 1983, Ser. No. 558,874

Int. Cl.³ D06F *17/08*

U.S. Cl. 68—133 **15 Claims**

11. A means for converting oscillatory rotation into vertical reciprocating motion comprising:

a rotationally oscillating drive barrel,

a thruster barrel rotatably and reciprocably mounted on said drive barrel,

means retarding rotary movement of said thruster barrel,

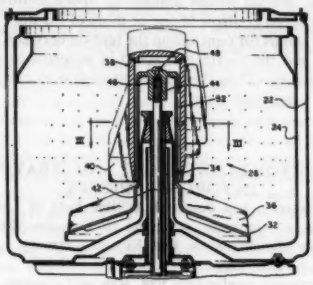
pin means projecting radially from one of said barrels toward the other,

recessed channel means formed in the surface of the other of said barrels to receive said pin means,

said channel means comprising a circuit with upper and lower legs and angled side legs connecting said upper and lower legs and including means allowing one way movement of said pin means around said channel circuit,

whereby rotational movement of said drive barrel will cause

relative movement between said pin means and said channel means causing said pin means to move around said channel



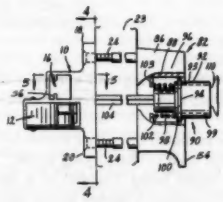
circuit in the direction allowed by said channel means thereby causing said thruster barrel to reciprocate.

4,520,639

DOUBLE DEAD BOLT DOOR LOCK

George Wartian, Detroit, Mich., assignor to Wartian Lock Co., St. Clair Shores, Mich.

Filed Dec. 6, 1982, Ser. No. 447,235
Int. Cl.³ E05B *65/06*
U.S. Cl. 70—110 **9 Claims**



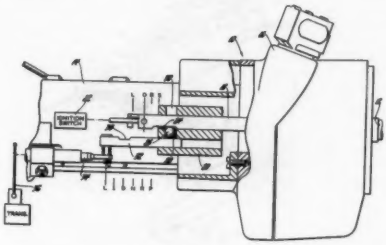
1. A double dead bolt door latch and lock mechanism for a door comprising a housing adapted to be mounted on the door, a latch movably mounted on said housing and when in operative position adapted to engage a keeper to maintain said door closed, an operator mounted on said housing and operable to withdraw said latch from operative position to release said latch from engagement with the keeper and permit the door to be opened, a dead bolt mounted on said housing for movement from an extended operative position engageable with a keeper recess to lock the door in closed position to a retracted inoperative postion, and single means for moving said bolt to its operative position and simultaneously locking said latch in its operative position, said single means comprising an actuator having a pin and slot connection with said bolt and rotatable in one direction to a first position to move said bolt to its extended, operative position and rotatable in the opposite direction to a second position to move said bolt to its retracted, inoperative position, said actuator having a part movable into blocking relation to said latch when said actuator is rotated in said one direction to lock said latch in its operative position, and movable out of blocking relation ot said latch when said actuator is rotated in said opposite direction to permit said latch to be withdrawn, said part of said actuator being a ring for blocking said latch as aforesaid which has a peripheral notch for clearing and unblocking said latch when said actuator is rotated in said opposite direction to said second position.

4,520,640

POSITION CONTROL MECHANISM FOR A VEHICLE IGNITION LOCK

Richard L. Kramer, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 297,232, Aug. 28, 1981, abandoned. This application Jun. 30, 1983, Ser. No. 509,403
Int. Cl.³ E05B *65/12*
U.S. Cl. 70—248 **5 Claims**



1. A position control mechanism, a steering column, a steering column mounted ignition lock cylinder mechanism and a floor-mounted transmission shift control mechanism, said position control mechanism comprising; a guide member secured to the steering column, an ignition pin member slidably disposed in said guide member and cooperating therewith to form an axially extending lock recess and being movable to a plurality of positions including "Lock" by the ignition lock mechanism, a shift pin member sidaby disposed in said guide member and cooperating therewith to form an axially extending park recess selectively alignable with the lock recess and being movable to a plurality of positions including "Park" by the transmission shift control mechanism, and interlock means disposed in said guide member and being engaged in the lock recess in the ignition pin for preventing the ignition pin from moving to the "Lock" position unless the park recess is engaged, being engaged in the park recess in the shift pin when the shift pin is in the "Park" position for preventing movement of the shift pin from the "Park" position when the ignition pin is in the "Lock" position, and being movable between the recesses when the ignition pin is out of the "Lock" position and the shift pin is in the "Park" position.

4,520,641

COMBINATION LOCK WITH SECURITY FEATURE

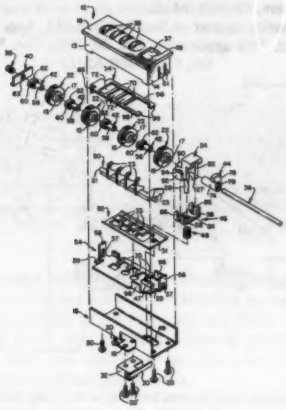
Lazlo Bako, Woodcliff Lake, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Dec. 14, 1981, Ser. No. 330,694
Int. Cl.³ E05B *37/02*
U.S. Cl. 70—312 **25 Claims**

1. A combination lock including a plurality of combination dials each of which must be disposed in a particular rotational orientation in order to open the lock, a movable locking member released by the dials for movement only when the dials are each in said particular orientation, a manual actuator associated with the locking member for opening the lock when the locking member is released, coupling means between the locking member and the manual actuator, means for releasing the coupling means responsive to movement of the actuator from a first to a second position when opening the lock, and upsetting means operatively connected between the manual actuator and at least one of the dials for rotating the dial out of said particular orientation by movement of the manual actuator beyond the second position.

8. A combination lock having a plurality of axially aligned rotary combination dials which must each be disposed in a particular rotational orientation to enable the lock to be opened, combination sleeves releasably coupled to the respective dials for rotation therewith, a manual actuator for opening

the lock when the dials are disposed as aforesaid, and a manually operable shift member for axially moving the sleeves out of coupling engagement with the dials when the dials are



disposed as aforesaid, characterized in that the shift member has an operating portion disposed in a pocket formed in the manual actuator, the pocket being accessible from one side of the actuator to permit operation of the shift member.

4,520,642

CONTROL DEVICE FOR CONTINUOUS ROLLING MACHINE

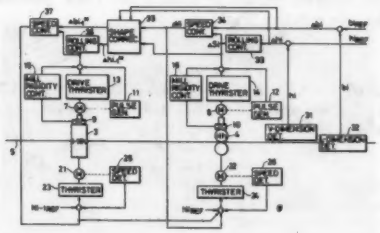
Shuheu Niino; Koichi Ishimura; Ken Okamoto, and Koichi Ohba, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 425,792

Claims priority, application Japan, Sep. 30, 1981, 56-157218; Sep. 30, 1981, 56-157219; Sep. 30, 1981, 56-157220

Int. Cl.³ B21B *37/12*

U.S. Cl. 72—8 **4 Claims**



1. A control device for a continuous rolling machine, comprising; a lateral dimension detector for detecting a lateral dimension bi of a material at the exit of an ith mill stand, first means receiving a difference Δbi between the detected value bi from said lateral dimension detector and a reference lateral dimension biREF and generating a speed control output directed to speed controls of one or more of the ith, i−1th and i−2th mill stands for controlling the tension between an i−1th mill stand and the ith mill stand so that said difference is reduced to zero, and shape correction means receiving said control output of said first means and said a difference Δbi in the lateral dimension for calculating a change value hi−1* in the vertical dimension and a change value bi−1* in the lateral dimension of the i−1th mill stand as will reduce the difference Δbi to zero in accordance with a predetermined algorithm; rolling control means for controlling the rolling position of the i−1th mill stand in accordance with said change value hi−1* in the vertical dimension as calculated by said shape correction means, and second means generating speed control signals directed to speed controls of one or more of the ith, i−1th and i−2th mill stands for controlling the tension between an i−2th mill stand and the i−1th mill stand in accordance with said change value bi−1* in the lateral dimension as calculated by said shape correction means.

4,520,643

ASSEMBLY FOR BLOWING OUT AND SPRAYING DIES IN FORGING PRESSES

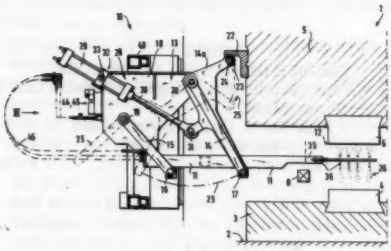
Eberhard Werner, and Friedrich Willim, both of Leverkusen, Fed. Rep. of Germany, assignors to Eumuco Aktiengesellschaft Für Maschinenbau, Fed. Rep. of Germany

Filed Aug. 2, 1983, Ser. No. 519,647

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1982, 3230095

Int. Cl.³ B21C *43/00, 9/00*

U.S. Cl. 72—39 **18 Claims**



1. An assembly for blowing and spraying dies in forging presses having a mold area and a press plunger, said assembly comprising:

(a) nozzle means mounted on carrier means to move into and out of the mold area of the forging press,

(b) the carrier means being coupled to a four-bar linkage including two levers each having an end facing away from the carrier means being pivotably mounted to a support means,

(c) one of the levers being connected to a drive means with the support means being fixedly secured with respect to the forging press, to define a drive lever mounted to move independent of the press plunger, and

(d) said drive lever being connected via a connecting rod to a crank mechanism.

4,520,644

SPRING COILING MACHINE WITH IMPROVED CUT-OFF MEANS

Bernard P. Lampietti, Goshen, Conn., assignor to Torin Corporation, Torrington, Conn.

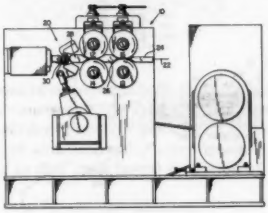
Continuation of Ser. No. 570,427, Jan. 13, 1984, abandoned, which is a continuation of Ser. No. 510,992, Jul. 5, 1983, abandoned, which is a continuation of Ser. No. 224,919, Jan. 14, 1981, abandoned. This application Oct. 10, 1984, Ser. No. 659,498

Int. Cl.³ B21F *11/00*

U.S. Cl. 72—131 **2 Claims**

1. In a cyclically operable spring coiling machine having a vertical front frame and a coiling station at an upper portion thereof; the combination of at least one pair of oppositely rotatable feed rolls on said frame for intermittently advancing wire longitudinally to the coiling station, at least one coiling tool at the coiling station arranged to engage the longitudinally

advancing wire to obstruct the linear movement thereof whereby progressively to bend the same about the coiling arbor and impart a coiling stress thereto resulting in the formation of a coiling spring configuration at a leading end portion thereof, an anvil means at said coiling station, a pair of cut-off tools at said coiling stations generally on opposite sides of said coiling arbor and co-operable with said anvil means intermittently to sever coiled leading end portions of the wire whereby to provide individual coil springs, a pair of holders for said cut-off tools respectively mounted on pivotally supported shafts and exposed at the front of the machine frame for urging the cut-off tools toward and away from the anvil means and wire coiled thereabout, said pivot shafts projecting rearwardly through the machine frame and carrying interconnecting gears at rear end portions thereof whereby to pivot said tool holders in unison but in generally opposite directions toward and away from the anvil means, a continuously rotating horizontal shaft forming a part of the coiling machine drive mechanism and having one end portion projecting forwardly through the



vertical front frame of the machine beneath and in spaced relationship with said tool holders, and motion transmitting and converting means exposed at the front of the machine frame and connected between said projecting end portion of said shaft and one of said tool holders and operable to effect a single tool holder and cut-off tool movement of each tool holder toward and away from said anvil means and wire coiled thereabout during each rotation of said shaft, said motion transmitting and converting means comprising an eccentric mounted on the forwardly projecting end portion of said continuously rotating shaft and an associated arm oscillable thereby to effect the tool holder movement as aforesaid, said oscillable arm being directly connected at one end thereof to said eccentric on said projecting end portion of said continuously rotating horizontal shaft, and further, directly connected at an end of said arm opposite said one end to said one of said tool holders, said arm including an adjustment for changing the throw of said cut-off tools toward and away from the anvil means and wire coiled thereabout.

4,520,645

FEEDING THIN FOIL-LIKE MATERIAL INTO A GAP BETWEEN A PAIR OF ROTATABLE ROLLS

Hugh M. Ross, Poole, and Peter G. Grocock, Ringwood, both of England, assignors to Davy McKee (Poole) Limited, Poole, England

Filed Jan. 17, 1983, Ser. No. 458,708

Claims priority, application United Kingdom, Jan. 26, 1982, 8202181

Int. Cl.³ B21B *39/02*

U.S. Cl. 72—250 **12 Claims**

1. Apparatus for feeding the leading end of the outer turn of a coil of web material into a gap defined between a pair of rotatable rolls, comprising:

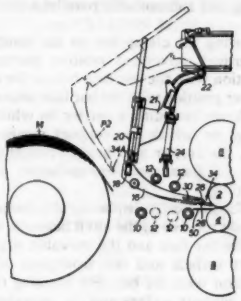
a pair of rotatable rolls having a gap defined therebetween;

means for supporting a coil of web material at a location spaced from said pair of rotatable rolls;

a structure having a length comparable to the width of said web material;

means for moving said structure between said coil of web material and said pair of rotatable rolls so as to move said leading end of said outer turn of said coiled web material from said coiled web material location to said gap of said pair of rotatable rolls;

suction means mounted upon said structure for grasping said outer turn of said coiled web material at a predetermined distance rearwardly of said leading end of said web material; and



means mounted upon said structure for blowing air past said leading end of said web material so as to properly orient said leading end of said web material relative to said gap defined between said pair of rotatable rolls and thereby facilitate the feeding of said leading end of said web material into said gap defined between said pair of rotatable rolls.

4,520,646

SHEET-METAL BENDING BRAKE

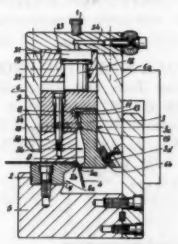
Alexis Pauzin, 19, montee des Soldats, Caluire (Rhone), France

Filed Mar. 18, 1983, Ser. No. 476,523

Claims priority, application France, Mar. 19, 1982, 82 05046

Int. Cl.³ B21D *5/04*

U.S. Cl. 72—313 **8 Claims**



1. A sheet-metal bending brake comprising:

a substantially stationary anvil having a flat and horizontal support surface bounded by and having a straight and horizontal stationary bending edge and a back surface also bounded by and extending downward from the stationary bending edge and forming an acute angle with the support surface, whereby a plate workpiece to be bent is supported on the support surface with an edge region projecting horizontally backward beyond the stationary edge;

a bending frame displaceable vertically above the anvil;

a movable bending blade carried on the frame pivotal about a horizontal axis parallel to the bending edge and having a horizontal and movable bending edge parallel to the stationary edge, the blade being pivotal on the frame between a back position with the movable edge spaced horizontally parallel to the support surface from the sta-

tionary edge and a front position with the movable edge generally aligned vertically perpendicular to the support surface with the stationary edge, the blade having a horizontally directed front face bounded by the movable edge and formed with a cutout open horizontally parallel to the support surface toward the stationary edge;

a clamp bar above the support surface adjacent the blade and having a downwardly directed clamp-bar face vertically confronting and substantially parallel to the support surface;

means supporting the clamp bar on the bending frame for limited vertical movement relative thereto between a lower position with the bar face below the movable edge and an upper position with the bar face above the movable edge, the frame including a carrier on which the blade is pivoted and on which the support means supports the clamp bar, the carrier also being vertically displaceable relative to the frame between an upper position and a lower position;

drive means for vertically displacing the frame with the bar and the blade relative to the anvil between an upper position with the bar face and the movable edge both above the support surface and the workpiece thereon and a lower position with the bar face pressing the workpiece against the support surface and the movable edge below the stationary edge and through an intermediate position with the bar face and the movable edge level with each other and both engaging the workpiece, the front face of the blade and the back surface of the anvil at least partially horizontally confronting each other in the lower position of the blade, whereby the bar clamps the workpiece to the anvil and downward movement from the intermediate position to the lower position of the blade bends down the workpiece edge region;

means between the blade and the frame for pivoting the blade from the back position in the upper and intermediate positions of the frame into the front position in the lower position of the frame, the stationary edge being aligned with and engaging into the cutout of the front face of the blade in the lower position of the frame and front position of the blade, whereby the workpiece end region can be bent through more than a right angle; and

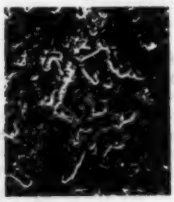
biasing means between the carrier and the frame for urging the carrier into the respective lower position.

4,520,647

SURFACE FINISHING PROCESS

James Economy, San Jose, and Anagnostis E. Zachariades, Hillsborough, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,351
Int. Cl.³ B21B *3/00*
U.S. Cl. 72—365 **2 Claims**



AS RECEIVED. Al Mg SUBSTRATE REINFORCED WITH Si C_f WHISKERS AFTER ROLLING

1. A method for simultaneously modifying the rough micro surfaces on opposite faces of a recording disk substrate, the rough micro surfaces extending beyond the bulk thickness of the substrate, comprising the steps of:

placing the substrate between a pair of rollers, said rollers having a surface finish smoother than the rough micro surfaces of the substrate, the hardness of the surfaces of said rollers exceeding the hardness of the rough micro surfaces to be modified,

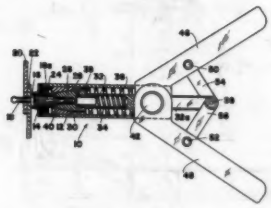
and applying through said rollers a deformational force to the rough micro surfaces to be modified which exceeds the elastic limit of the rough micro surfaces to be modified to produce plastic deformation thereof, said deformation extending into the rough micro surfaces no greater than approximately four microns, without lessening the bulk thickness of the substrate or otherwise modifying the bulk properties of the substrate.

4,520,648

LEVER OPERATED RIVETER

Jack T. Gregory, Penngrove, Calif., assignor to Gregory Tool Systems, Inc., Sonoma, Calif.

Filed Feb. 1, 1984, Ser. No. 576,022
Int. Cl.³ B21D *31/00*
U.S. Cl. 72—391 **3 Claims**



1. A mechanical pulling tool comprising:

a slideway;

a nose piece carried on one end of said slideway to press against a surface;

a gripping member slidable along said slideway to pull a work-piece away from said surface;

a pair of squeezable handles pivoted about a common axis on the other end of said slideway;

a rod carrying said gripping member at one end thereof and extending rearward through said common axis and between said handles, with the other end thereof being located rearward of said other end of said slideway, said rod being encompassed by said slideway; and

a pair of links, each pivoted at one end to one of said handles near said common axis, and extending inward of said handles and rearward of said common axis to pivot at the other end thereof to said other end of the rod so that squeezing said handles extends said links to pull said rod and gripping member away from said nose piece.

4,520,649

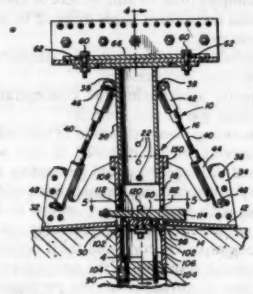
VEHICLE ANCHORING STAND

George D. Barton, Sr., Rte. 2, Box 103, Clear Creek Rd., Mabank, Tex. 75147

Filed Aug. 2, 1983, Ser. No. 519,231
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—457 **12 Claims**

1. A vehicle anchoring stand including horizontal base structure having a central opening therein and a plurality or outer marginal portions spaced about said central opening and disposed in a plane spaced slightly below the central portion of said base structure defining said opening, upright central post structure supported from said central portion of said base structure, attaching structure carried by the upper end portion of said central post structure for anchoring to a vehicle frame, and anchor means carried by said base structure and operative through said opening for tightly drawing said central portion of said base structure downward relative to a flor anchor, said base structure being slightly flexive whereby downward draw-

ing of said central portion relative to said floor anchor will insure tight full seated engagement of said marginal portions with opposing floor surfaces disposed about said floor anchor, brace structure extending and connected between said marginal portions and corresponding peripherally spaced portions



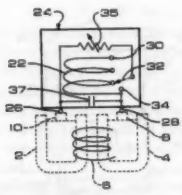
of upper portions of said central post structure, whereby flexing of the base structure as said central portion is draw downward toward said floor anchor will place said upper portions of said central post structure under compression through said brace structure to thus resist lateral deflection of said central post structure.

4,520,650

FIELD-PORTABLE CALIBRATION UNIT FOR ELECTROMAGNETIC FLOW METERS

David A. Palmer, and James K. Palmer, both of San Luis Obispo, Calif., assignors to Montedoro-Whitney Corporation, San Luis Obispo, Calif.

Filed Sep. 28, 1983, Ser. No. 536,749
Int. Cl.³ G01F *25/00*
U.S. Cl. 73—3 **12 Claims**



1. A field-portable calibrator for calibrating an electromagnetic flow velocity sensor of the type that uses a coil to generate a time-varying magnetic field whose lines of flux extend perpendicular to the direction of flow and that includes electrodes spaced apart in a direction that is perpendicular to both the direction of flow and the direction of the lines of flux, said field-portable calibrator characterized in that it simultaneously checks for accuracy both the strength of the time-varying magnetic field generated by the sensor and the determination made by the sensor of the flow velocity, and further characterized in that it requires neither water nor a source of electrical power, said field-portable calibrator comprising in combination:

pickup means for intercepting a precisely known percentage of the lines of flux when the sensor is engaged with the calibrator during calibration and for responding to the time-varying magnetic field by producing an electrical signal that bears a known constant relationship to the time-varying magnetic field; and,

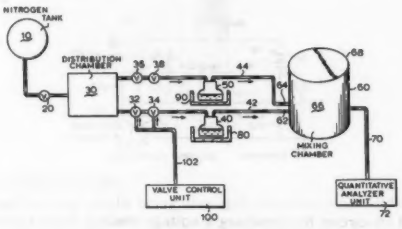
feedback means connected to said pickup means for applying said electrical signal to the electrodes of the sensor.

4,520,651

METHOD AND APPARATUS FOR OBTAINING THE COMBINED AROMA OF SEVERAL SUBSTANCES

Ira Litman, 41 Holiday Park Dr., Hauppage, N.Y. 11788

Filed Apr. 19, 1982, Ser. No. 369,846
Int. Cl.³ G01N *31/00*
U.S. Cl. 73—23 **9 Claims**



1. A method of obtaining a combination of volatile substances having a preselected aroma, said method comprising:

mixing the vapors of each volatile substance with an odorless gas to form several gas mixtures;

blending the gas mixtures to form a gas composite; determining the aroma of said gas composite; and

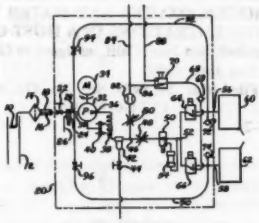
varying said mixture until said preselected aroma is obtained.

4,520,652

SYSTEM FOR OBTAINING EXHAUST SAMPLES AND ANALYZING THE SAME

Michael S. Englund; Joseph C. Hafele, both of Peoria, and Dwain C. Schulze, Jr., North Pekin, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 311,858, Oct. 16, 1981, Pat. No. 4,386,534.
This application Jan. 28, 1983, Ser. No. 461,727
Int. Cl.³ G01N *1/24, 1/26*
U.S. Cl. 73—23 **5 Claims**



1. A method of analyzing, on a fuel specific basis, the exhaust of a combustor for constituent levels without measuring fuel consumption rates, comprising:

partially filling a sample collecting container (60,62) with dried air;

thereafter directing the exhaust to be analyzed into said sample collecting container (60,62);

subsequently measuring the combined dried air and exhaust to determine the volumetric levels of at least two constituents therein each of whose level is changed by combustion from the level present in ambient air; and

calculating the fuel specific basis level of one of said constituents utilizing the data obtained in the step of measuring,

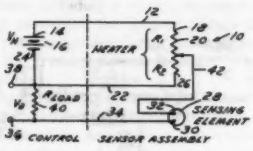
and the normal volumetric level of the other constituent in ambient air.

4,520,653

CIRCUITS FOR OBTAINING A VOLTAGE READING FROM A SENSING ELEMENT

William J. Kaiser, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 29, 1983, Ser. No. 527,633
Int. Cl.³ G01N *27/12*
U.S. Cl. 73—23 **14 Claims**



1. A circuit for obtaining a voltage reading from a sensing element, characterized by:

a voltage source;

a resistance heater;

first circuit means for connecting a first end of said voltage source to a first end of said resistance heater;

second circuit means for connecting a second end of said voltage source to a second end of said resistance heater;

a sensing element having two leads;

third circuit means for connecting a first one of said leads of said sensing element to an external circuit;

a load resistor coupled between said second circuit means and said third circuit means; and

interconnecting circuit means for coupling a second one of said leads of said sensing element intermediate said resistance heater;

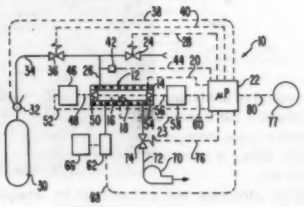
said electrical resistance of said resistance heater being substantially less than said electrical resistance of said sensing element.

4,520,654

METHOD AND APPARATUS FOR DETECTING HYDROGEN, OXYGEN AND WATER VAPOR CONCENTRATIONS IN A HOST GAS

James H. Terhune, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Mar. 14, 1983, Ser. No. 475,340
Int. Cl.³ G01N *29/02*
U.S. Cl. 73—24 **8 Claims**



1. Apparatus for analyzing samples of an atmoshere drawn from the containment of a nuclear plant, said atmosphere being substantially constituted of varying concentrations of first, second and third constituent gases diffused in a host gas, said apparatus being operative to determine the concentrations of said first, second and third constituent gases in said host gas, said apparatus comprising:

a sonic cell for holding a fixed volume of gas;

first means coupled with said sonic cell for introducing unknown samples of said containment atmosphere into said sonic cell;

second means coupled with said sonic cell for introducing calibration samples from an atmosphere of known concentrations of said constituent gases difussed in said host gas into said sonic cell;

means for establishing said samples at a standard, predetermined temperature and pressure;

means for directly ascertaining the concentration of said third constituent gas in said samples;

ultrasound generating means disposed in said sonic cell;

ultrasound receiving means disposed in said sonic cell a predetermined distance from said generating means;

exhaust means for discharging samples from said sonic cell;

means coupled with said receiving means and said third constituent gas gas ascertaining means for calculating the concentrations of said second and third constituent gases in said samples in response to the attenuation factor and the transit time of ultrasonic waves propagated through said unknown samples across said predetermined distance, the concentration of said third constituent gas and the attenuation factor and the transit time of ultrasonic waves propagated through a calibration sample;

said calculating means being coupled with said first means, second means, third gas ascertaining means, ultrasound generating means and exhaust means for controlling or monitoring the operation thereof; and

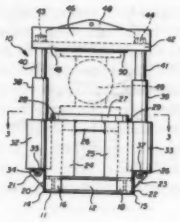
means coupled to the calculating means for displaying the calculated results.

4,520,655

VALVE TESTING APPARATUS

Ester L. Owens, Houston, Tex., assignor to Gordon E. Eldridge, Friendswood, Tex., a part interest

Filed Dec. 18, 1981, Ser. No. 331,994
Int. Cl.³ G01M *3/28*
U.S. Cl. 73—46 **15 Claims**



1. An apparatus for fluid testing high pressure valves comprising

a rigid supporting base,

a test table supported on said base, having a central opening for application of fluid pressure and API grooves in the supporting face thereof for sealing one opening of a valve being tested,

a pair of fluid operated cylinders positioned on opposite sides of said test table and supported on said base,

a pair of pistons, one in each of said cylinders, for application of compressive force by retraction thereof under fluid pressure,

a clamping bar extending between and supported on the ends of said pistons, and adapted to support a closure plate for supporting and sealing another opening of a valve being tested,

controllable means for supplying fluid pressure to said test table opening, comprising

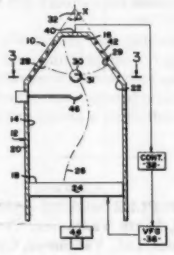
a hydraulic fluid reservoir,
a hydraulic fluid pump having an inlet connected to said reservoir,
a selector valve having an inlet connected to the outlet of said hydraulic fluid pump and a plurality of outlets,
one of said selector valve outlets being connected to said reservoir,
another of said selector valve outlets being connected to one side of each of said cylinders, and
another of said selector valve outlets being connected to the other side of each of said cylinders, and
controllable means for supplying fluid pressure to said cylinders for clamping a valve to be tested between said clamping bar and said test table.

4,520,656

GRAVITY ENHANCED ACOUSTIC LEVITATION METHOD AND APPARATUS

Martin B. Barmatz, Glendale; James L. Allen, LaCrescenta, and Dan Granett, Los Angeles, all of Calif., assignors to The United States of America as represented by the Adminstrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 9, 1983, Ser. No. 559,988
Int. Cl.³ G10K *10/00*
U.S. Cl. 73—505 **8 Claims**



1. An acoustic levitation system for use in an environment wherein a gravity or other force urges an object in a predetermined downward direction, comprising:
walls forming a chamber having a top wall, a bottom wall, and side walls, said side walls forming a stabilizer location at a position along the height of said chamber where said side walls are angled so they converge in an upward direction; and
means for applying acoustic energy to said chamber at a frequency which is resonant to the height of said chamber to produce a standing wave pattern along the height of the chamber, said frequency chosen so there is an acoustic levitation surface at the height of the stabilizer location.

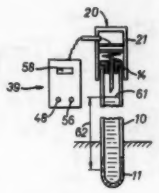
4,520,657

APPARATUS FOR DETERMINING THE PRESSURE OF CAPILLARY WATER, ESPECIALLY IN SOIL

Hans-Peter Marthaler, Adlikon bei Regensdorf, Switzerland, assignor to Dr. von Ballmoos AG, Horgen, Switzerland

Filed Jul. 19, 1983, Ser. No. 515,121
Int. Cl.³ G01N *19/10*
U.S. Cl. 73—73 **6 Claims**

1. An apparatus for determining the pressure of capillary water in the ground, especially in soil, said apparatus comprising:
a probe tube adapted to be filled with a measuring liquid and to be partially inserted into the soil;
said probe tube having a first end structured to be introduced into the soil to be investigated;
a porous plug closing said first end of said probe tube and being permeable for said measuring liquid opposite said first end;
said probe tube having a second end;
a closure member closing said second end of said probe tube;
a pressure measuring device for measuring the pressure prevailing in said probe tube above said measuring liquid;
said pressure measuring device comprising an elastically deformable membrane;



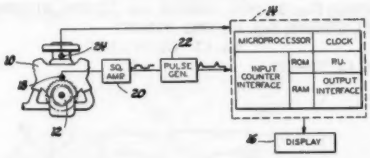
a hollow needle;
said hollow needle being arranged to interconnect said measuring chamber and said internal space of said probe tube; and
said closure member at said second end of said probe tube forming a plug of a pierceable and self-sealing material.

4,520,658

METHOD OF LOCATING ENGINE TOP DEAD CENTER POSITION

William P. Ryan, Royal Oak, and Thaddeus Schroeder, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1983, Ser. No. 556,790
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117.3 **4 Claims**



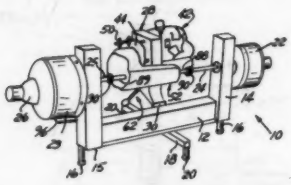
1. A method of determining the location of top dead center position of at least one cylinder of an internal combustion engine having an output shaft whose instantaneous rotational velocity undergoes cyclic changes at the combustion frequency of the cylinders, the method comprising the steps of:
monitoring the instantaneous rotational velocity of the output shaft;
determining the angular position of the output shaft at which the angular velocity of the output shaft is minimum as an estimation of engine top dead center; and
correcting the angular position estimation of engine top dead center with a predetermined velocity and combustion timing dependent correction angle corresponding to the average rotational velocity of the output shaft and the combustion timing angle, whereby the corrected angular position of the minimum angular velocity of the output shaft corresponds substantially to top dead center position of the engine.

4,520,659

TRANSMISSION TESTER

Carroll J. Lucia, 2703 Bay Settlement Rd., Green Bay, Wis. 54301, and George C. Lucia, 214 N. Superior St., DePere, Wis. 54115

Filed May 10, 1983, Ser. No. 493,301
Int. Cl.[3] G01M *15/00*
U.S. Cl. 73—118 27 Claims



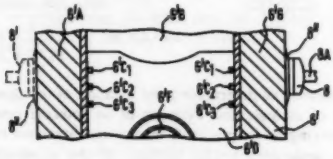
1. A transmission testing apparatus comprising a frame member, at least one upright member disposed at an end of said, said upright member having a shaft journalled therethrough and an inertia flywheel supported by said shaft for rotation thereby, an adjustably positionable bulkhead, a prime mover mounted on one side of said bulkhead, said prime mover having an output shaft, a transmission support plate removably attached to said bulkhead and having mounting apertures for affixing thereto a transmission to be tested, said transmission having an input shaft aligned with said prime mover output shaft for coupling to said prime mover output shaft and an output shaft, means for displaceably and adjustably supporting said bulkhead relative to said frame member for aligning said transmission output shaft with said inertia flywheel shaft, and means for coupling said transmission output shaft to said inertia flywheel shaft.

4,520,660

ENGINE TESTING APPARATUS AND METHODS

Keith N. Hitchcock, Worcester, England, assignor to Froude Consine Limited, England

Continuation-in-part of Ser. No. 455,418, Jan. 3, 1983, Pat. No. 4,444,049. This application Oct. 12, 1983, Ser. No. 541,041
Claims priority, application United Kingdom, Dec. 22, 1980, 8040966; Dec. 22, 1980, 8040969; Jan. 22, 1981, 8102004; Jan. 4, 1982, 8200089; Sep. 13, 1982, 8226057
Int. Cl.[3] G01M *15/00*
U.S. Cl. 73—120 31 Claims



1. A method of detecting a piston ring of a piston in a cylinder of a piston engine, comprising the steps of:

directing an ultrasonic beam through the cylinder block of the engine towards the cylinder;

moving the piston in the cylinder; and

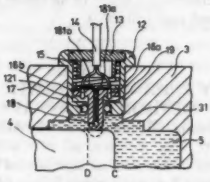
receiving and examining an ultrasonic signal from the cylinder for a characteristic of the piston ring; wherein the ultrasonic beam and the ultrasonic signal are transmitted and received respectively as a series of pulses and wherein each received ultrasonic signal pulse is transduced into a corresponding electrical signal pulse and wherein each electrical signal pulse is sampled at a timed instant which is such that the portion sampled of each electrical pulse is dependent in value upon the presence and absence respectively of the piston ring in the ultrasonic beam.

4,520,661

TEMPERATURE AND WEAR SENSOR FOR A BRAKE

Takashi Tamai, Hirakata; Shigefumi Tomiyama, Higashiosaka, and Nobumasa Ohshima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 24, 1983, Ser. No. 497,582
Int. Cl.[3] G01L *5/28*
U.S. Cl. 73—129 12 Claims



1. A temperature and wear sensor for a brake having a shoe movable by a piston and cylinder against a rotating part comprising:

a composite position and temperature sensing device engageable between the cylinder and the piston, said device including:

means for detecting and electrically indicating predetermined changes in temperature; and

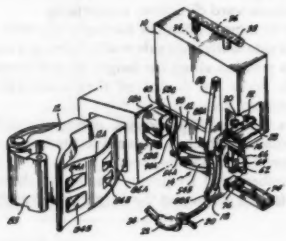
means including switch means operable by a predetermined relative position between the cylinder and the piston for electrically indicating a predetermined wear condition of the shoe.

4,520,662

COUPLER MOUNT ASSEMBLY

Hartmut Schmid, North Vancouver, Canada, assignor to Glenayre Electronics, Ltd., Vancouver, Canada

Filed Sep. 9, 1983, Ser. No. 530,724
Int. Cl.[3] G01L *5/28*
U.S. Cl. 73—129 20 Claims



17. A coupler mount assembly for use with a railway vehicle coupler including a side wall having a convex exterior surface that is provided with a first pair of vertically aligned and spaced-apart relief holes adjacent the coupler tip and a second pair of vertically aligned and spaced-apart relief holes adjacent the coupler base, said coupler mount assembly being adapted to mount an equipment housing on the coupler and comprising:

first and second jaw means, each of which includes a hook;

support means to which the equipment housing may be secured, said support means additionally supporting said first and second jaw means for movement relative to each other and so that the hooks thereof project from said support means and face each other; and,

clamping means supported by said support means for draw-

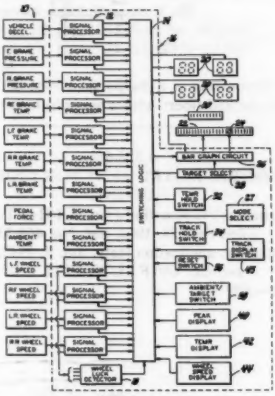
ing said first and second jaw means toward each other, whereby said hooks of said first and second jaw means clamp an intermediate portion of the coupler side wall between the first and second relief hole pairs when said hook of said first jaw means has been inserted into one hole of the first relief hole pair and said hook of said second jaw means has been inserted into a corresponding hole of the second relief hole pair.

4,520,663

VEHICLE BRAKE TEST APPARATUS

George R. Moore, Englewood, and Daniel H. Mahannah, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1983, Ser. No. 563,219
Int. Cl.³ G01L *5/28*
U.S. Cl. 73—129 **5 Claims**



1. Vehicle brake test instrumentation for monitoring operation and performance parameters of a brake system while under control of a vehicle operator comprising

transducers coupled to the vehicle and the brake system for sensing values of parameters,

display means including a target lamp and a line of lamps adjacent thereto,

control means for processing information sensed by the transducers and controlling the display means, the control means including means for establishing a desired value of an operator controlled parameter and means for illuminating only the target lamp when the controlled parameter is substantially at the desired value and for illuminating a successive one of the line of lamps for each increment of deviation of the actual parameter value from the desired value whereby the line of lamps indicates in bar graph form the instantaneous amount of deviation from the desired value so that the operator can readily view and interpret the information while trying to attain the desired value.

4,520,664

TIRE PRESSURE INDICATOR

Robert Kramer, 23417 Mary, Taylor, Mich. 48180

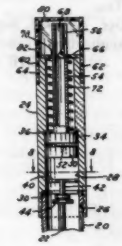
Filed May 26, 1983, Ser. No. 498,420
Int. Cl.³ B60C *23/04*
U.S. Cl. 73—146.8 **4 Claims**

1. A visual tire pressure indicator for application to a standard tire valve stem which comprises:

(a) a hollow body unit to be secured at a first end to a standard valve stem and having at the other end an axially extending indicator post,

(b) a pressure responsive means movable within said body to be exposed to the tire pressure and biased against said tire pressure, and

(c) shield means on said pressure responsive means extending



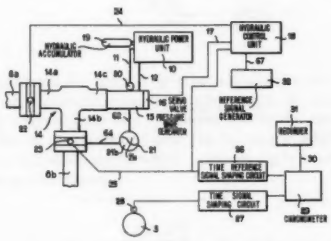
over said indicator post to shield said post from view in one position of said pressure responsive means and to expose said indicator post in other positions of said pressure responsive means, said body at its other end having a cap telescoping over and secured to said body, and said indicator post projecting axially outward of said cap away from said body.

4,520,665

SYSTEM FOR DETECTING A NATIVE RESERVOIR FLUID IN A WELL BORE

Bernard Cordier, Billere, and Christian Berge, Morlaas, both of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Jul. 11, 1983, Ser. No. 512,365
Claims priority, application France, Jul. 13, 1982, 82 12248
Int. Cl.³ E21B *47/10*
U.S. Cl. 73—155 **13 Claims**



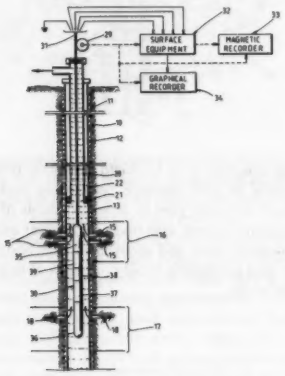
1. A system for detecting a pressure wave of the type comprising means for injecting a drilling fluid, means for recovering said drilling fluid after it has circulated within a well bore, wherein said system further comprises a device for generating at least one pressure wave, means for detecting the pressure wave as it passes through a first pipe in which the auxiliary drilling fluid circulates in the uncontaminated state, means for detecting said pressure wave as it passes through a second pipe in which said drilling fluid circulates and may be contaminated by a reservoir fluid which has entered said drilling fluid at any point of the well bore.

4,520,666

METHODS AND APPARATUS FOR DETERMINING FLOW CHARACTERISTICS OF A FLUID IN A WELL FROM TEMPERATURE MEASUREMENTS

Andrea Coblentz, Paris; Didier Lefevre, Elancourt, both of France; Pascal Colombani, Littleton, Colo., and Denis Meunier, Paris, France, assignors to Schlumberger Technology Corp., Houston, Tex.

Filed Dec. 12, 1983, Ser. No. 560,354
Claims priority, application France, Dec. 30, 1982, 82 22100
Int. Cl.[3] E21B *47/06*
U.S. Cl. 73—155 14 Claims



1. A method for determining the flow rate of fluid in a well over an axial interval which includes zones where fluid is exchanged between the well and the formations, comprising the steps of:

measuring the temperature along said interval;

measuring the flow rate at at least two axially separated points of said interval where accurate flow rate measurements can be determined;

combining said measured temperatures and said measured flow rates, in a manner enabling the determination of a flow rate value for a given point located between said axially separated points from the temperature measurement at said given point.

4,520,667

NONMECHANICAL DIGITAL RAINGAUGE

Joseph A. Nelson, Box 249, Le Grand, Iowa 50142

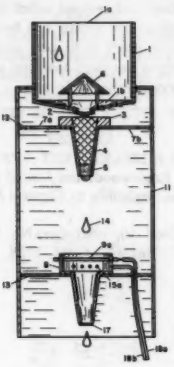
Filed Sep. 7, 1983, Ser. No. 530,055
Int. Cl.[3] G01W *1/14*
U.S. Cl. 73—171 5 Claims

1. A gauge for measuring low to heavy rainfall comprising,

(1) A rainwater collection means (1) having an upwardly facing opening (1*a*) and a downwardly sloping base (1*b*) leading to a smaller opening,

(2) a rainwater transfer means including a filter (2) below said smaller opening and a deflector (6) preventing direct impingement of rainwater upon the filter,

(3) An equal water droplet volume discharge means (3,4, 5) including a discharge funnel (3) positioned below said



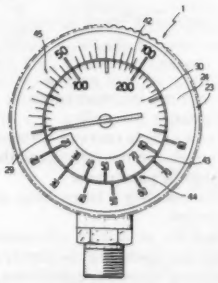
filter terminating in a discharge orifice (5) and a mass of loosely packed fibers within said discharge funnel.

4,520,668

MANOMETRIC INSTRUMENT FOR UNDERWATER DIVING

Emilio Allemano, Via Rosolino Pilo, 4, 10143 Torino, Italy

Filed Feb. 24, 1983, Ser. No. 469,336
Claims priority, application Italy, Jul. 5, 1982, 67852 A/82
Int. Cl.[3] G01F *23/18;* G01L *7/08*
U.S. Cl. 73—300 7 Claims



1. A manometric instrument for use with air bottles of an underwater respirator for underwater diving, comprising:

a sealed casing having a transparent closure cover;

a first fixed scale disposed at a fixed position within said casing for indicating a first unit of measurement, such as pressure, said first fixed scale having graduations based on the first unit of measurement;

a second fixed scale disposed at a fixed position within said casing adjacent said first fixed scale for indicating pressure, said second fixed scale having graduations based on a second unit of measurement different from said first unit of measurement;

one of said first and second units of measurement expressing units of lengths, and the other of said first and second units of measurement expressing residual pressure of air in said air bottles;

an adjustable support element displacable with respect to said first and second fixed scales;

a first movable scale fixed on said support element and hav-

ing graduations based on said second unit of measurement and differing from said second fixed scale;

a second movable scale fixed on said support element for indicating an ascent time as a function of the depth underwater and the residual pressure, when said support element is adjustably displaced such that a value on said first movable scale is brought into coincidence with the same value on said second fixed scale;

an indicator element movable along said first fixed scale and said second movable scale; and

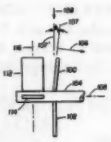
a transducer device for detecting pressure and for controlling the position of said indicator element in dependence on the detected pressure so as to indicate the ascent time on said second movable scale.

4,520,669

CROSS-AXIS ACCELERATION COMPENSATION FOR ANGULAR RATE SENSING APPARATUS

Billie F. Rider, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 28, 1982, Ser. No. 402,522
Int. Cl.³ G01C *23/00*; G01P *15/09*
U.S. Cl. 73—510 **6 Claims**



1. A sensor assembly, comprising:

an inside-out motor having a central shaft fixed with respect to a major axis of reference of a vehicle, a stator affixed to the shaft, and a rotating element including a motor housing, means for journaling the motor housing to the shaft, the motor housing having a spin axis coaxial with the shaft, and cylindrical means mounted inside the motor housing and juxtaposed with the stator for driving the motor housing, the motor housing being driven at a substantially constant spin frequency in response to alternating current applied to the stator;

a first cantilevered piezoelectric bender element mounted exteriorly on the motor housing for rotation therewith, said first bender element having a bending axis essentially normal to the spin axis of the cylindrical housing and an axis of sensitivity essentially parallel with the spin axis of the motor housing;

second and third cantilevered piezoelectric bender elements mounted exteriorly on the motor housing for rotation therewith, said second and third bender elements each having a bending axis essentially parallel with the spin axis of the motor housing and an axis of sensitivity essentially normal to the spin axis of the motor housing, the axes of sensitivity of said second and said third bender elements being angularly displaced from each other;

a circuit-bearing substrate mounted exteriorly on the motor housing for rotation therewith;

first circuit means on said circuit-bearing substrate responsive to an electrical signal generated by said first bender element for generating a first output signal representative of angular displacement with respect to inertial space of the major axis of reference of said vehicle;

second and third circuit means on said circuit-bearing substrate each responsive to an electrical signal generated, respectively, by said second and said third bender elements for generating, respectively, a second and a third output signal representative of linear acceleration of said vehicle in a plane perpendicular to the major axis of reference of said vehicle, the instantaneous direction of the linear acceleration sensed being along the axes of sensitivity of said second and said third bender elements;

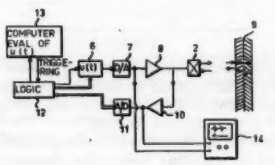
means coupled to said first circuit means for selecting a portion of each said second and said third output signals, said first circuit means including means for summing said signal portions with the first output signal to cancel signal components representative of cross-axis accelerations sensed by said first bender element.

4,520,670

METHOD AND APPARATUS FOR GENERATING SHORT ULTRASONIC ECHO PULSES

Göran Salomonsson, Lagerbrings väg 7 C, S-222 51 Lund; Per O. Börjesson, Nygård, S-290 71 Mörrum; Bengt Mandersson, Magistratsvägen 29, S-222 43 Lund; Nils-Gunnar Holmer, Gilleskroken 7, S-222 47 Lund, and Kjell Lindström, N. Skogsvägen 3, S-236 00 Höllviksnäs, all of Sweden

PCT No. PCT/SE82/00431, § 371 Date Aug. 18, 1983, § 102(e) Date Aug. 18, 1983, PCT Pub. No. WO83/02330, PCT Pub. Date Jul. 7, 1983
PCT Filed Dec. 20, 1982, Ser. No. 527,576
Claims priority, application Sweden, Dec. 22, 1981, 8107731
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—602 **8 Claims**



5. An apparatus for generating short ultrasonic echo pulses including an ultrasonic transducer (2) having an excitation input, and a signal generator (1) connected to the excitation input of the ultrasonic transducer (2), by means adapted to generate an excitation signal which substantially is a weighted least squares filter signal.

4,520,671

METHOD AND MEANS FOR REAL TIME IMAGE ZOOM DISPLAY IN AN ULTRASONIC SCANNING SYSTEM

William R. Hardin, North Highlands, Calif., assignor to General Electric Company, Milwaukee, Wis.

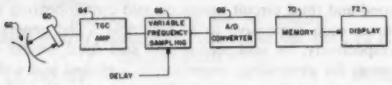
Filed Jun. 10, 1983, Ser. No. 503,161
Int. Cl.³ H04N *5/02*; G01N *29/00*; G06F *3/147*
U.S. Cl. 73—620 **5 Claims**

1. In an ultrasound imaging system in which a display is controlled by electrical signals based on reflected ultrasonic waves, a method of varying the size of a displayed area based on a user selected scale factor and user selected start and stop points comprising the steps of

transmitting ultrasonic pulses,

generating electrical signals in response to echoes of said ultrasonic pulses,

sampling said electrical signals at a plurality of sampling rates depending on a scale factor indicative of desired size of a display image said step of sampling being delayed after said step of transmitting ultrasonic pulses whereby



sampled signals are obtained only from a limited area as established by user selected start and stop points,

generating pixel illumination data corresponding to the sampled electrical signals, and

controlling scan lines in said display image by said pixel illumination data.

4,520,672

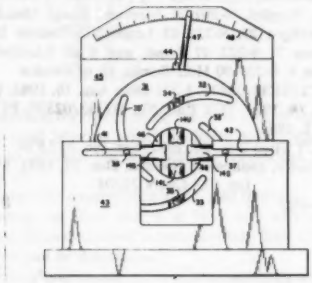
THICKNESS MEASURING

John D. Saint-Amour, 158 E. Main St., Westboro, Mass. 01581

Filed Aug. 19, 1982, Ser. No. 409,589

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—622 **11 Claims**



1. An ultrasonic thickness measuring system comprising,

first and second opposed ultrasonic probes defining a channel therebetween for accommodating tubing whose thickness is to be measured thereby,

said probes being formed with passages extending into said channel for receiving fluid under pressure for preventing bubbles in said fluid between said tubing and said probes when said tubing is in said channel,

slotted cam means for supporting said probes and controlling their radial displacement from the axis of said channel,

and means for rotatably supporting said cam means whereby rotation of said cam means displaces each of said probes radially by equal radial increments to maintain said probes at substantially the same radial distance from said axis.

4,520,673

INSPECTION DEVICE, ESPECIALLY FOR STEAM GENERATOR TUBES

Thomas Müller, Erlangen, and Rainer Bauer, Herzogenaurach, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

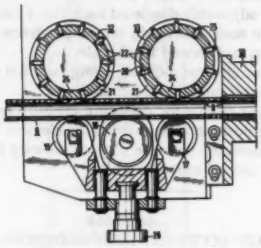
Filed Jan. 28, 1983, Ser. No. 462,052

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3202883

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—623 **6 Claims**

1. Inspection device, comprising a probe having a flexible thrust hose for moving said probe, said thrust hose having mutually equidistant holes formed therein along a generatrix line thereof, a feed device having two drive wheels for engaging said thrust hose to move said probe, and plugs disposed on



said drive wheels for insertion in said holes, said support plugs on one of said drive wheels being circumferentially offset relative to said support plugs on the other of said drive wheels.

4,520,674

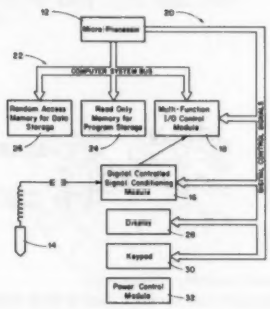
VIBRATION MONITORING DEVICE

Ronald G. Canada; Kenneth R. Piety; Daniel G. Simpson, all of Knoxville, and E. Forrest Pardue, Lenoir City, all of Tenn., assignors to Technology for Energy Corporation, Knoxville, Tenn.

Filed Nov. 14, 1983, Ser. No. 551,338

Int. Cl.³ G01H *1/00*

U.S. Cl. 73—660 **16 Claims**



1. A portable vibration monitoring device for use in connection with a base computer which stores data regarding the nature and parameters of vibration measurements to be made on preselected machines by such device, said device comprising:

power supply means;

a vibration sensor which produces an analog signal representative of selected vibration of said machine upon mechanically connecting said sensor with said machine at preselected measurement points thereon;

signal conditioning means for conditioning said analog signal generated by said vibration sensor, said signal conditioning means including anti-aliasing means for filtering preselected frequencies from said signal generated by said sensor to enhance the accuracy of the data collected;

means connected with the output of said signal conditioning means including multiple modules which are selectively energized, one of said modules comprising high speed math processor means;

processing means for selectively energizing said modules for purposes of reducing power consumption, for loading and

retrieving information and instructions, and for selectively employing said anti-aliasing means for analysing digital information concerning vibration data stored in said device and for selectively interfacing with an operator by causing information to be displayed, and for controlling the various operational modes of said device;

means operably connected to said processing means for entering and loading instructions and information for controlling the operation of said device;

first memory means for storing operating instructions for use by said processing means; and

further memory means for storing data collected by said device from preselected locations upon said machines.

4,520,675

PRESSURE OR PRESSURE DIFFERENCE MEASURING TRANSDUCER

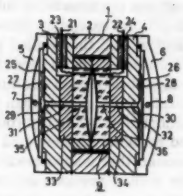
Horst Ziegler, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 31, 1983, Ser. No. 480,742

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3213320

Int. Cl.³ G01L *9/12*

U.S. Cl. 73—718 **6 Claims**



1. In a pressure or pressure difference measuring transducer comprising:

a diaphragm clamping housing;

two fixed capacitor plates in said housing;

a measuring diaphragm clamped between the two fixed capacitor plates;

a pressure housing;

a ring shaped support element which is elastic in the radial direction supporting the clamping housing in the pressure housing; and

first and second separating diaphragms mounted to the pressure housing such that they rest against suitably formed shaped beds in the pressure housing in the event of an overload, the improvement comprising:

the ring shaped support element being designed and connected to the pressure housing and the diaphragm clamping housing in such a manner that a connection between the pressure housing and the diaphragm clamping housing which is stiff in a direction parallel to the axis is produced.

4,520,676

ADJUSTABLE TANGENT ASSEMBLY FOR A DIAPHRAGM GAS METER

Irwin A. Hicks, Radnor, and Charles W. Albrecht, Warminster, both of Pa., assignors to The Singer Company, Stamford, Conn.

Filed Apr. 25, 1983, Ser. No. 488,290

Int. Cl.³ G01F *3/22*

U.S. Cl. 73—281 **13 Claims**

1. A tangent assembly for a positive displacement diaphragm gas meter to drivingly couple a flag assembly to a crank shaft, comprising:

a lock plate non-rotatably connected to said crank shaft along the axis of rotation thereof;

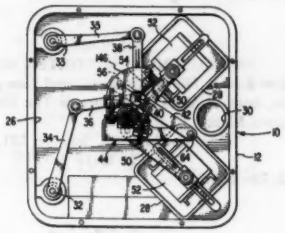
a timing plate;

a stroke plate pivotally connected to said timing plate;

means for pivotally connecting one of said timing and stroke plates to said lock plate;

a first connecting mechanism connected between said lock plate and said one of said timing and stroke plates, said first connecting mechanism being adjustable and adapted to vary the distance between its connection point on said lock plate and said one of said timing and stroke plates so as to pivot said one of said timing and stroke plates with respect to said lock plate;

a second connecting mechanism connected between said stroke plate and said timing plate, said second connecting mechanism being adjustable and adapted to vary the distance between its connection points on said stroke plate and said timing plate so as to pivot said stroke plate with respect to said timing plate;



first adjusting means mounted on said lock plate and coupled to said first connecting mechanism for effecting adjustments to said first connecting mechanism;

second adjusting means mounted on said lock plate and coupled to said second connecting mechanism for effecting adjustments to said second connecting mechanism;

a wrist pin connected to said stroke plate and extending outwardly therefrom parallel to said crank shaft axis of rotation; and

means for connecting said flag assembly to said wrist pin.

4,520,677

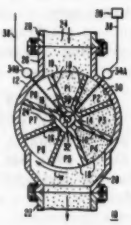
SOLIDS MASS FLOW INDICATION WITH RADIATION

Joseph E. Macko, and Isnard Estriplet, both of Irwin, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 30, 1981, Ser. No. 316,697

Int. Cl.³ G01F *1/86*

U.S. Cl. 73—861 **3 Claims**



1. An improved rotary feeder system for transporting solid particulate material of the type having a rotary feeder including a plurality of vanes extending radially from a rotating shaft so as to form pockets rotatable within a housing between a housing inlet where said solid material is received by said pockets and a housing outlet where said solid material is discharged from said pockets, said improvement comprising:

a flux discharging radiation source disposed within said shaft;

a first radiation detector disposed externally of said rotatable pockets downstream of said inlet and upstream of said outlet;

a second radiation detector disposed externally of said rotatable pockets downstream of said outlet and upstream of said inlet;

means for measuring the amount of flux transmitted through said pockets to said first and second detectors, said means providing signals indicative of mass content within said rotatable pockets; and

means for correlating said signals to provide an indication of mass flow through said pockets.

4,520,678

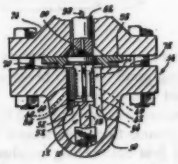
SMALL LINE-SIZE VORTEX METER

Stanislaw Koziol, North Attleboro, and George E. Sgourakes, Millis, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Sep. 13, 1983, Ser. No. 531,561

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.24 **17 Claims**



1. Flow-metering apparatus of the type comprising a flow tube having a vortex-shedding element to produce vortices at a rate corresponding to the fluid flow rate;

an external housing integral with said flow tube and formed with a pair of pressure chambers;

the wall of said flow tube being apertured adjacent said vortex-shedding element to form a pair of side-by-side large-area impulse ports located to receive differential pressure fluctuations developed by said vortices;

said impulse ports communicating directly with said pressure chambers respectively and providing for the delivery of vortex pressure energy into said chambers without excessive attenuation;

diaphragm means in said housing responsive to said differential pressure fluctuations and forming part of a sealed cavity having a liquid fill; and

a sensor element responsive to pressure fluctuations transmitted through said diaphragm means and operable to produce corresponding flow measurement signals.

4,520,679

LOAD CONVERTER

Yotaro Hatamura, 2-12-11 Kohinata, Bunkyo-ku, Tokyo, Japan

Filed Oct. 6, 1982, Ser. No. 433,109

Int. Cl.³ G01L *5/16, 1/22*

U.S. Cl. 73—862.04 **11 Claims**

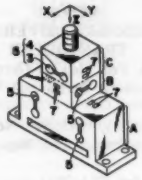
1. A load converter comprising:

a detecting block having first and second opposite planar, parallel, outside surfaces and a through-hole, located between said first and second outside surfaces, extending in a first direction through said block parallel to said outside surfaces;

said through-hole consisting of first and second cylindrical end hole portions respectively defined by first and second cylindrical surfaces in said block respectively adjacent said first and second outside surfaces, and a narrow hole portion elongated in a second direction so as to connect said first and second end hole portions;

said block having first and second side portions on opposite first and second sides of said through-hole, extending between said first and second outside surfaces;

said first cylindrical surface and said first outside surface, and said second cylindrical surface and said second outside surface, respectively defining therebetween respective first and second thin walled block portions, each concurrently bendably deformable at said first and second sides of said through-hole in opposite directions by strains on said block in directions perpendicular to said outside surfaces;



said first and second side portions being substantially thicker in crosswise directions extending between each other, than said first and second thin walled portions, and said first and second outside surfaces extending in said crosswise directions distances beyond said first and second end hole portions substantially greater than the thicknesses of said first and second thin walled portions, such that the only thin walled portions adjacent said through-hole are said first and second thin walled portions, and said first and second thin walled portions are substantially rigid against deformation in response to oppositely directed forces in said crosswise directions.

4,520,680

TORQUE MEASURING APPARATUS

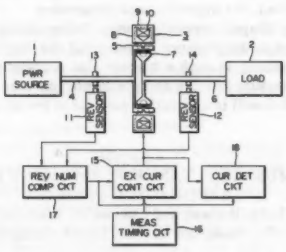
Takumi Tatsumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1983, Ser. No. 486,963

Claims priority, application Japan, Apr. 26, 1982, 57-72390; Apr. 26, 1982, 57-72391

Int. Cl.³ G01L *3/14*

U.S. Cl. 73—862.19 **2 Claims**



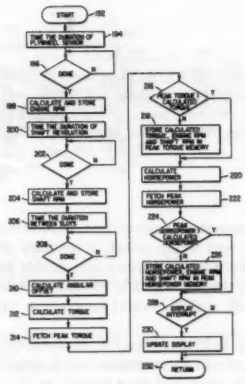
1. A torque measuring apparatus for measuring a torque which is transmitted from a power source to a load, comprising an electromagnetic powder clutch which is interposed between a power source and a load driven by said power source, means for controlling an exciting current of said electromagnetic powder clutch so as to establish a slight slip state between an input side and an output side of said electromagnetic powder clutch, and means to measure the exciting current of said

electromagnetic powder clutch in the slight slip state, thereby to measure the transmission torque.

4,520,681
APPARATUS FOR MEASURING TORQUE ON A ROTATING SHAFT

Jeff D. Moore; Eddie C. Moore, both of Mansfield; Burnis H. Tucker, Joshua, and William P. Goodwill, Plano, all of Tex., assignors to Jeff D. Moore and Eddie C. Moore, both of Mansfield, Tex.

Filed Mar. 19, 1984, Ser. No. 590,892
Int. Cl.³ G01L *3/12, 3/24*
U.S. Cl. 73—862.28 **8 Claims**



1. An apparatus for measuring torque on a rotating shaft, comprising:

a first sensor mounted proximate the shaft and having first and second states;

a first circular disk mounted on the shaft for rotation therewith, said disk having a first discrete reference area on the surface thereof for momentarily changing the state of said first sensor from a first state to a second state when said reference area is aligned with said sensor;

a second sensor mounted proximate the shaft and having first and second states;

a second circular disk mounted on the shaft for rotation therewith and displaced a predetermined distance from said first circular disk, said second circular disk having a second discrete reference area on the surface thereof for momentarily changing the state of said second sensor from a first state to a second state when said reference area is aligned with said sensor, the position of said second reference area being independent of the position of said first reference area about the circumference of said shaft;

means connected to said first and second sensors for comparing the states thereof to determine the relative angular position of said first and second reference areas when said first and second sensors momentarily change states, said comparing means calibrating the positional deviations of said first and second reference areas under low torque conditions such that the relative angular position is a function of torque only and not angular position under low torque conditions;

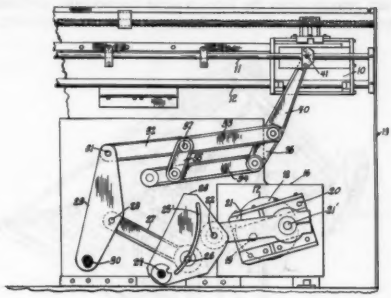
means for calculating torque as a function of deviations in the compared relative angular positions of said first and second reference areas, said deviations in the relative angular positions being due to torque deviations of the shaft between said first and second reference areas; and

means for determining peak torque over a given period of time, said determining means further including means for storing said peak torque.

4,520,682
RECIPROCATING RECTILINEAR MOTION APPARATUS

Robert Eitzinger, Wheeling, Ill., assignor to Mid-West Automation Inc., Wheeling, Ill.

Filed Oct. 29, 1981, Ser. No. 316,084
Int. Cl.³ F16H *21/32, 21/18*
U.S. Cl. 74—40 **1 Claim**



1. A mechanism for converting rotational drive motion into reciprocal rectilinear motion, comprising:

(a) a drive crank, one end of which is pivotally connected to a rotating drive source,

(b) a drive arm, one end of which is pivotally connected to the opposite end of said drive crank so as to be moved through an orbital path about the pivotal connection with a resulting circular movement through a vertical plane to the opposite end of said drive arm,

(c) a slotted adjustment plate supported by a fixed pivot pin extending in a vertical plane therefrom, with said opposite end of said drive arm connected thereto so as to reciprocally rock said adjustment plate through a vertical plane about said pivot pin,

(d) a stroke arm pivotally mounted in spaced relation to said adjustment plate and adapted to be reciprocally rocked in unison with said adjustment plate,

(e) a rocker arm having one end pivotally connected to said stroke arm and with its opposite end adjustably connected throughout the slot of said adjustment plate,

(f) a series of interconnected links forming a pantograph pivotally connected in vertical relation to said stroke arm and said adjustment plate,

(g) a drive link connected to one end of said stroke arm and with its opposite end connected to one of said interconnected links so as to pivot said pantograph through a vertical plane in response to adjusted pivotal movement of said stroke arm,

(h) a tow arm connected to a portion of said pantograph and pivotally connected to a reciprocally movable slide, and

(i) elongated guide means for said slide extending horizontally with respect to the vertical plane of said pantograph, stroke arm and slotted adjustment plate.

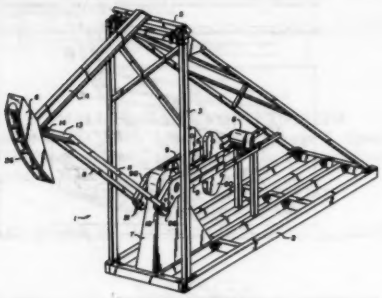
4,520,683
PUMP JACK SLANT WELLS

Wayne Haverstock, Daysland; David Krywchuk, Lloydminster, and Peter Masak, Scarborough, all of Canada, assignors to Universal Industries Ltd., Lloydminster, Canada

Filed Apr. 25, 1983, Ser. No. 488,350
Int. Cl.³ F16H *21/32;* G05G *1/04, 1/00;* E21B *19/00*
U.S. Cl. 74—41 **4 Claims**

1. In a pumping unit for reciprocating a rod string in a wellbore which is slanted at an angle from vertical, said unit having a Samson post assembly, a walking beam pivotally mounted at its rear end on the Samson post assembly, a pair of Pitman

arms, pivotally connected at their upper ends to the front end of the walking beam by a pin and hole means, for supporting said beam and rocking it through a predetermined stroke, rotating crank arms for biasing said Pitman arms, said crank arms each being pivotally connected at one end by pin and hole means to the lower end of one of the Pitman arms, the length of the Pitman arms between their pivot connections with the walking beam and the crank arms being their effective length, counterweight means attached to the crank arms at the latter's ends remote from the Pitman arms connection, and means for rotating said crank arms, the improvement comprising:



said walking beam being disposed downwardly at an angle from horizontal when said beam is at the mid-point of its stroke;

one of said walking beam and pair of Pitman arms having a plurality of pin holes formed in spaced apart arrangement along a plane generally coinciding with the axis of the Pitman arms, whereby the effective length of the Pitman arms may be adjusted by altering the location of the pins interconnecting the Pitman arms with the walking beam, to thereby vary the downward angle of the walking beam.

4,520,684

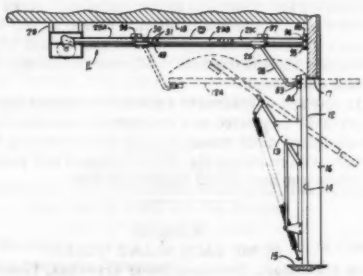
TAPE DRIVE CLOSURE OPERATOR

Lawrence L. Meyer, Canton, and Alvin J. Carli, Sebring, both of Ohio, assignors to The Alliance Manufacturing Company, Inc., Alliance, Ohio

Filed Feb. 3, 1983, Ser. No. 463,591

Int. Cl.³ F16H *27/02, 29/02*

U.S. Cl. 74—89.21 **12 Claims**



1. A motor-driven closure operator having a flexible tape with a plurality of longitudinally aligned apertures to mesh with teeth on a motor-driven drive member, said flexible tape adapted to be stressed longitudinally by movement of the drive member to actuate a closure, the improvement comprising:

means establishing the spacing and size of the apertures in said flexible tape in accordance with the number of active teeth on the drive member engaging the tape to establish the shear strength of the webs between longitudinally adjacent active tooth apertures approaching the tensile strength of the tape at an aperture.

4,520,685

SHIFT CONTROL MECHANISM OF AN AUTOMOTIVE MANUAL TRANSMISSION

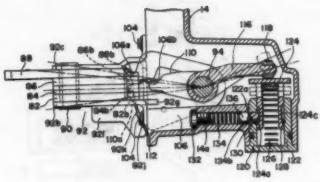
Kotei Takahashi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Feb. 19, 1982, Ser. No. 350,389

Claims priority, application Japan, Feb. 20, 1981, 56-22888

Int. Cl.³ B60K *20/00*

U.S. Cl. 74—473 R **5 Claims**



1. In an automotive manual transmission having a common fork shaft on and along which a plurality of shift forks are slidable and a control rod which is rotatable about and slidable along the axis thereof which is normal to the axis of said common fork shaft, a shift control mechanism subassembly comprising:

a generally U-shaped bracket removably connected to a housing of said transmission, said bracket having a pair of side walls connected by a bottom wall;

a pivoting pin supported by said bracket, said pin having opposite ends received in the bracket side walls, said pin having an axis which is normal to both the axes of said common fork shaft and said control rod;

a plurality of pivoting levers pivotally mounted on said pivoting pin so as to be pivotable about the axis of said pivoting pin, one end of each pivoting lever being pivotally jointed with an extension of the corresponding one of said shift forks to cause movement of the corresponding shift fork on and along the common fork shaft upon pivoting movement of the pivoting lever, said bracket and pivoting pin permitting subassembly of the pivoting levers on the bracket prior to mounting the bracket within the transmission housing; and

a head member secured to said control rod to be movable therewith, said head member being brought into engagement with the other end of a selected one of said pivoting levers upon rotational movement of said control rod about its axis into a predetermined angular position.

4,520,686

CONNECTING ELEMENT FOR GEARSHIFT LINKAGES

Rolf Renk, Ginsheim-Gustavsburg, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 7, 1983, Ser. No. 472,744

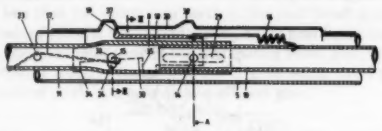
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208543

Int. Cl.³ G05G *9/18*

U.S. Cl. 74—473 R **27 Claims**

1. Connecting elements for gearshift linkages, especially gearshift linkages disposed between the transmission and the gearshift lever of a motor vehicle, in the form of a decoupling device located in a tubular casing and between two gearshift rods and adapted to permit, after the transmission has been shifted into any of the gears, forward and backward movement of the decoupled gearshift rod, the improvement comprising: the operative connection between the ends of the gearshift

rods in engagement with one another being by way of a pivotable spring-biased latch, said latch being pivotally mounted at the end of the gearshift rod connected with the gearshift lever



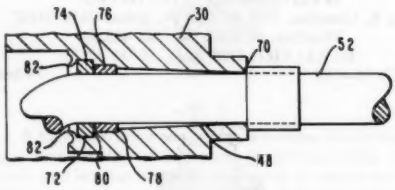
and being operatively associated with a drive pin mounted on the end of the other gearshift rod; and a cam adapted to engage into recesses provided on the casing surrounding the gearshift rods.

4,520,687

OPERATING MECHANISM FOR A CONTROL DEVICE

Gregory J. Golub, Athens, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 28, 1983, Ser. No. 470,648
Int. Cl.³ G05G *7/00*
U.S. Cl. 74—491 **9 Claims**



1. An operating mechanism for extending through an aperture in a housing wall, comprising:
a boss extending through the aperture in the wall and having a bore;
an operating shaft rotatably mounted within the bore;
the bore being tapered with one end being larger than the other end;
a shaft bearing within said one end; and
the shaft being supported solely by the boss at said other end.

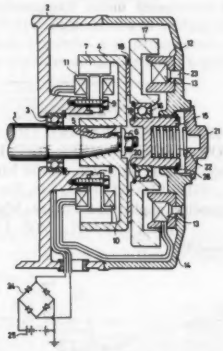
4,520,688

VARIABLE CAPACITY FLYWHEEL

Masaki Ban, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 447,574, Dec. 7, 1982, abandoned. This application Sep. 18, 1984, Ser. No. 652,156
Claims priority, application Japan, Dec. 19, 1981, 56-204512
Int. Cl.³ G05G *1/00*
U.S. Cl. 74—572 **1 Claim**

1. A variable capacity flywheel for an engine comprising:
a main flywheel coupled to an output shaft of said engine;
a permanent magnet mounted on said main flywheel wherein said main flywheel defines a generator rotor, a generator stator core and a clutch coil fixedly mounted on a housing in an operative arrangement with said permanent magnet wherein the a.c. output of said clutch coil increases as the speed of said engine increases;
means coupled to said main flywheel for generating an electrical signal;
at least one rotatable auxiliary flywheel mounted for rotation on an axis coincident with the axis of said output shaft;
a clutch facing mounted on the surface of said auxiliary flywheel confronting said main flywheel;
means to bias said auxiliary flywheel in engagement with said main flywheel, said biasing means comprising a compression spring aligned on said axis and constrained by a bearing holder for said auxiliary flywheel;
electromagnetic clutch emans energized by said electrical signal for selectively engaging and disengaging said main and auxiliary flywheels wherein at low engine speeds the excitation of said electromagnetic clutch is insufficient to overcome the force provided by said means to bias and at high speed ranges of the engine the excitation of said



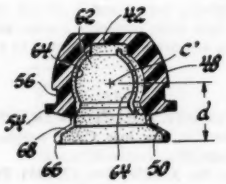
electromagnetic clutch provides a force overcoming the bias force and disengages said auxiliary flywheel from said main flywheel, wherein said electromagnetic clutch means comprises a clutch field core carrying a clutch field coil fixedly mounted relative to said auxiliary flywheel, said clutch coil connected in series to said clutch field coil for energization of said electromagnetic clutch means as a function of output shaft rotation.

4,520,689

WINDSHIELD WIPER TRANSMISSION

Jost S. Sucro, Huber Heights; Ted A. Moyer, Brookville, and William S. Shufflebarger, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 13, 1982, Ser. No. 434,114
Int. Cl.³ F16C *3/04*
U.S. Cl. 74—595 **2 Claims**



1. In vehicle windshield oscillatory motion transmission apparatus of the type including first and second transmission members limitedly rotatable relative to each other in diverse planes and one of which has affixed thereto a ball stud received for such relative rotation in diverse planes within a polymeric socket bushing mounted within an aperture in the other of said members, the improvement which comprises mounting said ball stud over a flat surface of said one member with the spherical center of the ball head of said stud located a predetermined distance above said surface, said bushing being constructed of a hard elastomer and including a ball coupling portion received within said aperture of said other member and formed with a thick wall defining an inner ball socket, said bushing further including a depending resilient annular skirt portion of substan-

tially thinner wall integral with said thick walled coupling portion and having a terminal annular end engaged with said surface of said first member, and a quantity of lubricant contained internally of said bushing, the dimension between the spherical center of the socket of said coupling portion and the terminal annular end of said skirt portion of said bushing when the latter portion is unstressed being predeterminedly greater than said predetermined distance of said ball head whereby upon installation of said ball stud within said bushing the skirt portion is prestressed under engagement of the lip thereof against said surface to an extent such that said lip is maintained resiliently thereagainst as a lubricant seal during said relative rotation of said transmission members in plural diverse planes.

4,520,690

INTER-AXLE DIFFERENTIAL TRANSFER BOX UNIT FOR A FOUR-WHEEL DRIVE VEHICLE

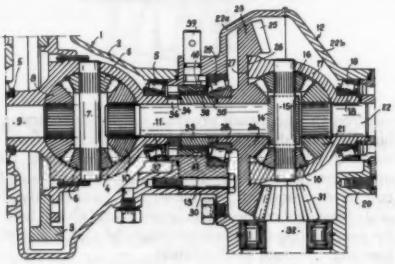
Henry Dangel, 7 Rue du Sillon, 68100 Mulhouse, France

Filed May 11, 1983, Ser. No. 495,393

Claims priority, application France, May 14, 1982, 82 08440

Int. Cl.³ F16H *37/08, 37/06*

U.S. Cl. 74—695 **10 Claims**



1. A transmission device for a four-wheel drive vehicle comprising at least two differentials, a first of said differentials having a first output semi-shaft and a second output semi-shaft respectively drivingly connected to a first driving wheel and to a second driving wheel of a first axle of the vehicle, a second of said differentials being interposed between the first differential and said first driving wheel, the second differential having an input element drivenly connected to said first semi-shaft of the first differential, a first output element drivingly connected to said first driving wheel and a second output element, a transmission shaft being drivenly connected to said second output element and drivingly connected to a second axle.

4,520,691

HYDROSTATIC REACTION TRANSMISSION

Waldo E. Rodler, Jr., San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

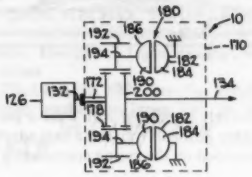
Division of Ser. No. 320,256, Nov. 12, 1981, Pat. No. 4,464,973.

This application Apr. 12, 1984, Ser. No. 599,430

Int. Cl.³ F16H *3/44, 1/28;* **F16D** *57/02*

U.S. Cl. 74—790 **1 Claim**

1. A reaction differential comprising a housing; means defining an input shaft journaled in said housing; means defining an output shaft journaled within said housing; differential means within said housing including a planetary gear train having an input portion operatively connected to said input shaft and an output portion operatively connected to said output shaft, said differential means including a rotor movable around an input sun gear and an output sun gear; torque reaction means within said housing including a plurality of stationary coupling blades secured to said housing and a plurality of rotatable coupling blades secured to said rotor closely adjacent said stationary blades and operatively connected to said output portion of said planetary gear train; input power means for driving said input shaft; means for directing hydraulic fluid into said torque reaction means for engagement with said coupling blades; said rotatable coupling blades rotating relative to said stationary blades for preventing rotation of said output portion in a predetermined direction until the rate of rotation of the input shaft



reaches a desired velocity, and thereafter said fluid in said torque reaction means applying a sufficient reaction torque against said rotatable coupling blades for progressively minimizing differential action and to progressively increase the speed of said output shaft.

4,520,692

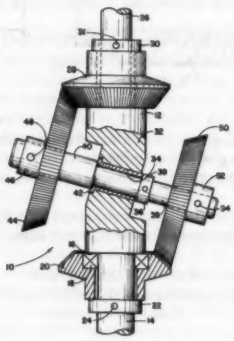
SPEED DIFFERENTIAL DEVICE

George E. Cummins, 3005 W. 45th Pl., Tulsa, Okla. 74107

Filed Sep. 24, 1982, Ser. No. 422,605

Int. Cl.³ F16H *1/30, 1/14, 35/00, 57/10*

U.S. Cl. 74—799 **7 Claims**



1. A speed differential device for a drive means and a driven means and comprising main shaft means, a pair of first angle rotatable elements secured in the proximity of the opposite ends of said main shaft means in spaced relation and independently rotatable with respect thereto, auxiliary shaft means interposed between the spaced first single rotatable elements and extending transversely with respect to the main shaft means, the auxiliary shaft means being rotated by the main shaft in such manner that the axis of rotation of the auxiliary shaft is the longitudinal axis of the main shaft, a pair of second single rotatable elements secured to said auxiliary shaft means and disposed on opposite sides of the main shaft means, one of said first single rotatable elements being disposed in driving engagement with one of said second single rotatable elements, and the second of said second single rotatable elements being in driving engagement with the second of said first single rotatable elements, the single rotatable elements being sized with relation to one another to provide a selected speed differential ratio between the drive means and the driven means, and wherein the first rotatable elements are level gears, and the second rotatable elements are mating bevel gears, and the ratio of teeth of the gears are selected to provide the selected speed differential between the drive means and the driven means, and

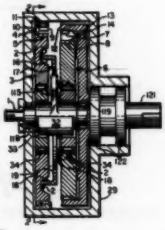
wherein the first of the bevel gears is in engagement with the first of the mating bevel gears and the second of the bevel gears is in meshing engagement with the second of the mating bevel gears, the number of teeth in the first mating bevel gear being one less than the number of teeth in the first bevel gear, the number of teeth in the second mating bevel gear being one less than the number of teeth in the first mating bevel gear, and the number of teeth in the second bevel gear being equal to the number of teeth in the first mating bevel gear.

4,520,693

HIGH RATIO DRIVE

Albert P. Sfredda, 2106 Iris Pl., Bethlehem, Pa. 18018

Filed Oct. 7, 1981, Ser. No. 309,240
Int. Cl.³ F16H *1/28, 13/06*
U.S. Cl. 74—804 **6 Claims**



1. A high ratio drive comprising, a housing fixedly supporting a first annular toothed raceway having rolling surface means, said housing rotatably supporting an output shaft concentrically secured to a second annular toothed raceway having rolling surface means, the first and second toothed raceways being axially aligned, a pair of axially coupled toothed wheels having rolling surface means, said toothed wheels disposed within said first and second toothed raceways, respectively, so as to have rolling contact and tooth interengagement therewith, rolling element bearing means mounted concentrically in said toothed wheels, a drive shaft axially aligned with said output shaft and rotatably supported by said housing, said drive shaft having a drive member connected thereto, said drive member engaging the inner race bore of said bearing means, radially moveable guide means connect said drive member and said inner race, resilient means connect said drive member and said inner race, thereby radially biasing said rolling element bearing means, whereby rotation of said drive shaft will cause the drive member to impart a radial driving force to said pair of toothed wheels.

4,520,694

METHOD OF CONTROLLING ENGINE OPERATION IN AN AUTOMOTIVE VEHICLE DURING GEAR CHANGE

Gerhard Eschrich, and Manfred Schwab, both of Gerlingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,132
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151252
Int. Cl.³ B60K *15/00, 41/14, 41/06*
U.S. Cl. 74—858 **5 Claims**

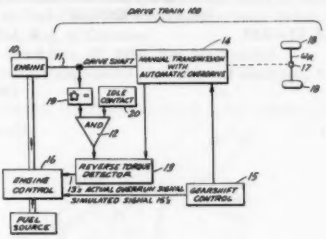
1. In an automotive vehicle having an engine (10), an accelerator pedal, and a drive train (100),

a method of controlling the drive train of the vehicle, said drive train (100) having

a transmission (14) driven by the engine (10), and vehicle wheels (18) driven by the transmission (14),

wherein the drive train includes means (13) for sensing the direction of power flow between the engine (10) and the wheels (18), and provides an output signal (13s) if the vehicle is operated under overrunning condition,

comprising the step of



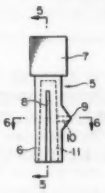
reducing power output of the engine to idling level by producing a simulated overrunning condition signal (15s) during occurrence of a gear change step for a period of time adjusted in accordance with then-pertaining engine speed parameters.

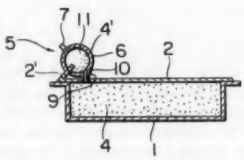
4,520,695

OPENING MEANS FOR POWDER VESSEL

Hiroaki Sugiyama, Numazu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,436
Claims priority, application Japan, Feb. 7, 1983, 58-16363[U]
Int. Cl.³ B67B *7/40*
U.S. Cl. 81—3.07 **1 Claim**





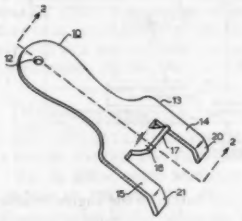
1. In an opening means for peeling a cover means from a powder receiving vessel, which cover means cover an opening of said vessel, said opening means comprising a hollow tubular body having ends and an outer wall and a hollow inside portion, said body being provided with a handle portion at one said end, said body having a substantially axially extending slit in said outer wall at the end of said body opposite to this handle, the improvement comprising a projection on the outer wall of said body, said projection being located so as t pierce the cover means and penetrate it through, upon opening, immediately before peeling off of the cover means starts, this projection having a through hole communicating through said outer wall from the inside portion of said body to outside of said body.

4,520,696

CHAMPAGNE BOTTLE OPENER

Martin H. Wolze, 3007 Hermosa Ave., La Crescenta, Calif. 91214

Filed Apr. 4, 1983, Ser. No. 481,735
Int. Cl.[3] B67B 7/00
U.S. Cl. 81—3.55 6 Claims



1. A champagne bottle opener comprising:

a unitary body including a handle portion and a working head portion, said working handle portion including at least one arm extending from said handle and defining with the body a recess of width less than the diameter of the neck ring of a champagne bottle;

said arm including an end bend for engaging the neck ring of the bottle and constituting a fulcrum point when opening said opener including a pry surface positioned within said recess and including an edge of sufficient sharpness to engage a portion of the cork;

whereby a cork may be removed from a champagne bottle by the application of downward pressure by the arm against the neck ring of the bottle and upward pressure against the cork by the edge of the pry portion.

4,520,697

RATCHET WRENCH

John B. Moetteli, 11524 Royalshire Dr., Dallas, Tex. 75230

Filed Sep. 29, 1982, Ser. No. 427,449
Int. Cl.[3] B25B 13/46
U.S. Cl. 81—62 35 Claims

1. A ratchet wrench for rotating a fastener, comprising:

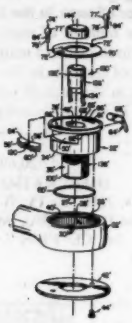
a handle having a head at one end thereof, the head having a cylindrical aperture formed therethrough centered on a rotational axis, a wall defining the cylindrical aperture defining ratchet teeth thereon surrounding its periphery;

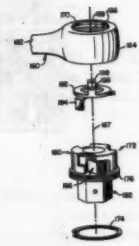
a drive member for mounting onto the handle and extending into the cylindrical aperture for rotation about the rotational axis relative to the handle, said drive member having a drive portion, the drive portion having an outer surface having a noncircular cross section for operable connection to a fastener for rotating the fastener and an inner surface having a noncircular cross section for operative connection to a fastener for rotation of the fastener, said drive member further defining an aperture extending therethrough along the axis;

ratchet means mounted on said drive member to engage the ratchet teeth on the head for selectively ratcheting the handle in either rotational direction about the rotational axis relative to the drive member and for securing the handle and drive member for joint rotation about the rotational axis in the opposite rotational direction;

a release member mounted on the drive member for movement along the rotational axis with respect to the drive member; and

at least one resilient means extending from an end of said release member and out of a notch in the drive portion for securing sockets to the drive portion, the notch having a camming surface thereon so that movement of the member in one direction along the axis with respect to the





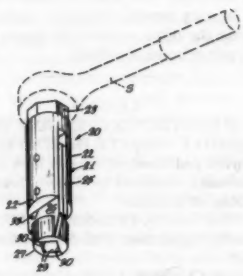
drive member cams said means out of engagement with the socket to permit removal of the socket.

4,520,698

ADJUSTABLE SOCKET FOR SOCKET WRENCHES

Werner W. Martinmaas, c/o Nevada Motorcycle Specialties, 48 Glen-Carran Cir., Sparks, Nev. 89431

Filed Jan. 18, 1984, Ser. No. 571,681
Int. Cl.[3] B25B 13/18
U.S. Cl. 81—128 13 Claims



1. An adjustable socket for turning threaded fasteners that have a polygonal head, said socket comprising, in combination:

a body member having parallel side plates joined at a rear end to a mounting means for detachably, fixedly securing said body member to a fastener driving tool;

two jaw members mounted between said side plates for concurrent movement parallel to the side plates, said jaw members having facing jaw elements which are at for-

ward ends of said jaw members and have angularly related faces arranged to engage plural sides of a polygonal fastener head, concurrent movement of said jaw members changing the space between said jaw elements;

control pin means supported on the body member and interengaged with slot means in the jaw members, said control pin means being movable along said slot means from end to end thereof, and being slightly movable across the slot means, said slot means being arranged so that movement of said control pin means along said slot means causes concurrent movement of the jaw members to change the space between the jaw elements, and engagement between a rear surface of said slot means and a rear surface of said pin means locks the jaw members in any attained position of adjustment;

and spring means biasing the jaw members to move the jaw elements toward one another and engage said rear surfaces.

4,520,699

ADJUSTABLE WRENCH

Miodrag Jeremic, 509 Carlaw Ave., Toronto, Canada M4K 3J3

Filed May 2, 1983, Ser. No. 455,954

Int. Cl.³ B25B *13/16*

U.S. Cl. 81—166 **1 Claim**

1. A wrench head of an adjustable wrench, said wrench head comprising a cavity, an adjustable key for varying the size of said cavity to accommodate different sizes of nuts and the like, cover plates on either side of said cavity, a threaded member substantially enclosed within said wrench head, securing means for releasably securing said threaded member to said key, an adjustment member for threadably engaging said threaded member to adjust position of said key, a first access in said wrench head through at least one of said cover plates for gaining access to and for removing said securing means to release said threaded member from said key, and a second access for removing said threaded member from said wrench head to enable repairs to or replacement of said threaded member while said key remains trapped in said wrench head by said cover plates.

4,520,700

TAILSTOCK FOR ROTATABLY MOUNTING A WORKPIECE IN PRECISION MACHINERY

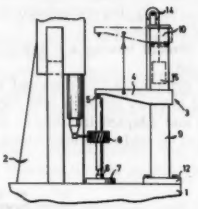
Klaus Herzog, Oberkochen; Franz Szenger, Konigsbronn, and Gabriele Gentner, Aalen-Ebnat, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stuftung, Heidenhheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Nov. 30, 1982, Ser. No. 445,536

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1982, 3237083

Int. Cl.³ B23B *17/00, 23/00;* **B23F** *23/12;* **G01B** *5/20*

U.S. Cl. 82—31 **10 Claims**



1. A tailstock for rotatably supporting a workpiece on a machine bed comprising:

a vertical column fixedly mounted to said machine bed, said vertical column having first and second regions, said second region being pivotally mounted to said first region, the pivotal axis of said second region being parallel to the longitudinal axis of said first region;

an offset arm extending laterally from said vertical column and carrying a workpiece engageable center, said arm having an opening for accommodating said first and second regions of said vertical column, said offset arm being displaceable along the longitudinal axis of said vertical column;

said offset arm being displaceable from said first region of said vertical column to said second region of said vertical column, said offset arm being pivotable about said pivotal axis when said offset arm is disposed at said second region of said vertical column and non-pivotable when disposed at said first region of said vertical column to thereby be disposed in precise spacial relation with said machine bed.

9. A tailstock for rotatably supporting a workpiece on a machine bed comprising:

a column fixedly mounted to said machine bed;

an offset arm extending laterally from said vertical column and carrying a workpiece engageable center, said offset arm having an opening for accommodating said column, said offset arm being displaceable along the longitudinal axis of said column; and

plain bearing in the form of cylinders disposed between said column and the opening in said offset arm, the longitudinal axis of said cylinders being parallel to that of said column, said cylinders being yieldably retained to said offset arm, and said cylinders being yieldable in a direction perpendicular to that of said column.

4,520,701

TOOL HOLDER FOR LATHE

Abe S. Watamura, 6626 Gatto St., El Cerrito, Calif. 94530

Filed Dec. 27, 1982, Ser. No. 453,781

Int. Cl.³ B23B *29/00*

U.S. Cl. 82—36 R **4 Claims**

1. A tool holder for a lathe comprising

a clamping block having means disposed beneath same for engaging a lathe for adjustable attachment thereto and including vertically disposed undercut key extending along a first side of said block,

a mounting element having a longitudinal tool-receiving

depression with means for gripping a tool disposed therein and having an undercut keyway across a side thereof opposite said depression and adapted to slidably engage the vertical undercut key of said clamping block, and

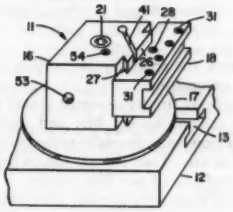
said clamping block having a slot vertically therethrough in extension through said key at an acute angle to said key to define a minor pivotal portion of said block and locking means in said block for adjustably engaging said pivotal portion of said block through said slot for pivoting said minor block portion to expand said key laterally and lock same in the keyway of said mounting element.

3. A tool holder for a lathe comprising

a clamping block having means disposed beneath same for engaging a lathe for adjustable attachment thereto and including a vertically disposed undercut key extending along a first side of said block,

a mounting element having a longitudinal tool-receiving depression with

means for gripping a toll disposed therein and having an undercut keyway across a side thereof opposite said depression and adapted to slidably engage the vertical undercut key of said clampling block,



said clamping block having a slot vertically therethrough in extension through said key to define a minor pivotal portion of said block and locking means in said block for adjustably engaging said pivotal portion of said block through said slot for pivoting said block portion to expand said key laterally and lock same in the keyway of said mounting element, and

said locking means comprising

an array of contiguous steel balls disposed in a lateral bore in said block extending to one side of said slot in said block,

a bolt theaded to a vertical bore in said block intersecting said lateral bore and having a further steel ball disposed in said vertical bore for engaging the lower end of said bolt of said bolt and engaging the outer side of the outermost ball of said array of balls above the center thereof for retaining said array in said lateral bore,

whereby threading of said locking bolt into said block forces an end ball of said arry of balls across said slot to deflect said pivotal block portion for laterally expanding said key,

forces an end ball of said array of balls across said slot to deflect said pivotal block portion for laterally expanding said key.

4,520,702

INSPECTION AND CUTTING APPARATUS

Walter L. Davis, Milton-Freewater, Oreg.; Dale Messenger, Montgomery, Ala., and Malcolm W. Randall, Milton-Freewater, Oreg., assignors to Key Technology, Inc., Milton-Freewater, Oreg.

Continuation-in-part of Ser. No. 388,138, Jun. 14, 1982, abandoned. This application May 27, 1983, Ser. No. 496,992

Int. Cl.³ B26D *5/34*

U.S. Cl. 83—71 **19 Claims**

1. Inspection and cutting apparatus for inspecting elongated articles to detect shade variation defects in the articles and for cutting one or more sections from the articles to remove the detected defects from the articles, comprising:

an article conveyor having a plurality of transversely spaced conveying lanes for receiving the elongated articles and moving the elongated articles single file in a plurality of transversely spaced lanes successively past an inspection station and a cutting station;

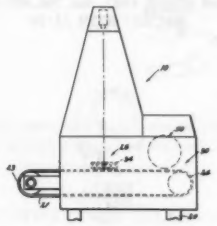
an electro-optical inspection means positioned at the inspection station for viewing the articles as the articles move through the viewing area at the inspection station and for generating electrical signals when defects are observed in which the signals are characteristic of the defects;

a cutting wheel assembly positioned at the cutting station at a selected downstream distance from the inspection station;

said cutting wheel assembly having a plurality of knife support rings aligned with the conveying lanes and mounted for rotational movement about a transverse axis in which the knife support rings have a periphery that moves in a circular path that is substantially tangent to the path of the articles;

said cutting wheel assembly having a set of cutter knives mounted for radial movement on each knife support ring at angularly spaced increments about the transverse axis for radial movement between retracted noncutting positions and extended cutting positions;

said cutting wheel assembly having a knife positioning means for selectively directing a fluid against the knife at a preselected angular position to push the knife radially outward from the retracted noncutting position to the extended cutting position;



drive means operatively connected to the knife support ring and responsive to the article conveyor for rotating the knife support ring in a forward direction about a transverse axis in coordination with the movement of the articles to synchronize the movement of the knives past the preselected angular position of the knife drive means in relation to the movement of the articles past the cutting station;

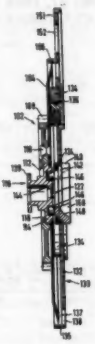
said cutting wheel assembly having track means for receiving the cutter knives when the cutter knives are in the extended cutting positions and for maintaining the cutter knives in the extended cutting position without the air of fluid as the knives move from the preselected angular position past the cutting station to cut the articles; and

control means operatively connected to the electro-optical inspection means for sensing the generation of the electrical signals and in response thereto selectively activating the knife positioning means to direct fluid against selected knives as the knives move past the preselected angular position of the knife drive means to push the selected knives outward to their extended cutting positions to enable the cutting track means to maintain the cutter knives in the extended cutting position to cut the sections containing the defects from the articles as the projected knives are progressively moved into the path of corresponding articles moving past the cutting station.

4,520,703
ELECTROMOTIVELY DRIVEN HOUSEHOLD SLICING MACHINE FOR FOOD

Max Speckhart, Traunstein, Fed. Rep. of Germany, assignor to BOSCH-SIEMENS HAUSGERAETE GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,767
Claims priority, application Fed. Rep. of Germany, May 18, 1982, 3228768; Jun. 23, 1982, 3223450
Int. Cl.³ B26D *4/28*
U.S. Cl. 83—478 **12 Claims**

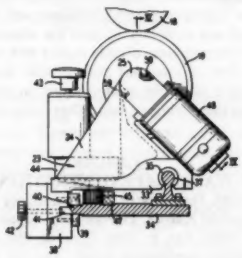


1. Slicing machine, comprising a housing, a cutting tool assembly having a side facing away from said housing, said cutting tool assembly including a cutting tool having a cutting edge for slicing and means for detachably locking said cutting tool assembly to said housing, and a protective shield being fastenable to said cutting tool assembly and protruding beyond said cutting edge at said side of said cutting tool assembly facing away from said housing, said protective shield including a key for operating said locking means.

4,520,704
MOTOR DRIVEN SLITTER OF NARROW CONFIGURATION

Alexis Olshansky, Becket, and Gerald A. Guild, Dalton, both of Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 5, 1983, Ser. No. 520,847
Int. Cl.³ B23D *19/04*; B26D *1/24*
U.S. Cl. 83—499 **17 Claims**



1. A paper web slitter adapted for separating a paper web of substantial width into a plurality of relatively narrow strips while the web and the strips travel longitudinally along a path continuously in one direction, and comprising:

a plurality of upper slitter heads located above said travel path and comprising carriages mounted adjustably along a horizontal beam extending over and across said path of travel and carrying upper downwardly directed rotary slitter blades for slittingly engaging the web from above;

a plurality of lower slitter heads located below said path of travel and supporting lower slitter blades directed upwardly and engageable with the underside of the web and cooperating with the upper slitter blades for severing the web along longitudinal lines;

a lower beam extending across said path under said lower slitter heads and supporting said lower slitter heads adjustably relative to one another along the length of the lower beam;

a relatively short journal box mounted on each of said slitter heads and rotatably mounting each of said lower slitter blades by means of a respective spindle extending axially into one end of said journal box on an axis parallel to said beams and with spaced precision bearings journalling the spindle in said journal box;

a motor carried by each of said lower carriages and having driving means extending from the motor into said journal box to the spindle on an axis generally normal to the spindle axis;

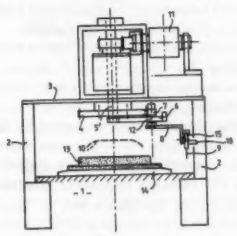
and power transmission means connecting said driving means in driving relation to said spindle between said bearings,

said lower carriages and lower blades and said motors being so related that the lower carriages with their blades and the motors are in such a narrow profile considered in the direction of web travel that the lower slitter heads can be adjusted so close to one another that the lower slitter blades are enabled to cooperate without any motor profile interference with the upper slitter blades for slitting the web into unusually narrow strips.

4,520,705
APPARATUS FOR DECORATING CONFECTIONERY AND BAKERY PRODUCTS

Noël Launay, Beauvais, France, assignor to Nestec, S. A., Vevey, Switzerland

Filed Feb. 4, 1983, Ser. No. 463,932
Claims priority, application France, Feb. 17, 1982, 82 02598
Int. Cl.³ B26D *3/08*
U.S. Cl. 83—879 **5 Claims**



1. An apparatus for scoring pastry comprising:

(a) a planetary train including a stationary wheel and a planet wheel in rolling engagement with said stationary wheel, the axes of said wheels being vertical;

(b) a cutting tool mounted to said planet wheel remote from the axis thereof;

(c) means for driving the planet wheel around the axis of the stationary wheel, whereby the tool will describe a repeating pattern of horizontally-extensive tracings;

(d) means for supporting beneath the tool a pastry to be scored; and

(e) vertical movement means for moving the tool upwardly and downwardly to engage the tool with a pastry supported by said supporting means and disengage the tool from such pastry, whereby the tool will score the pastry in a pattern corresponding to portions of said tracings.

4,520,706

ELECTRONIC MUSICAL INSTRUMENT

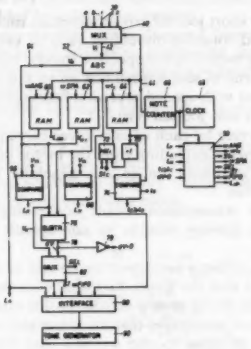
Christian J. Deforeit, Semur-en-Auxois, France, assignor to Matth. Hohner AG, Trossingen, Fed. Rep. of Germany

Filed Jan. 10, 1984, Ser. No. 569,579

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1983, 3301354

Int. Cl.³ G10H *3/00*

U.S. Cl. 84—1.1 **10 Claims**



1. In an electronic musical instrument, the instrument having at least a first keyboard with movable keys for selecting the sounds to be produced, the instrument further having tone generating circuitry responsive to signals produced by operation of the keys for providing signals which may be transduced into the selected sounds, the improvement comprising:

transducer means associated with each key, an electrical characteristic of said transducer means varying as a function of the pressure exerted on the associated key, said transducer means each having an output terminal;

electrical power supply means connected to said transducer means whereby voltages which vary as a function of the pressure exerted on the keys will be generated and will appear at said transducer means output terminals;

clock means for generating timing signals;

multiplexer means, said multiplexer means serially and cyclically sampling the voltages which appear at said transducer means output terminals and individually passing the sampled voltages;

means for converting the voltages passed by said multiplexer means into digital data commensurate therewith;

first comparator means for comparing digital data commensurate with the voltages appearing at each of said transducer means output terminals during two successive cycles of said multiplexer means, said first comparator means generating signals commensurate with the difference between the said each transducer means output terminal voltages;

means generating a signal commensurate with a threshold level of key pressure;

second comparator means for comparing said digital data from said converting means with said signal commensurate with the threshold pressure level and generating control signals indicative of the achievement of equality therebetween; and

means responsive to said control signals, said timing signals, said digital data commensurate with said transducer means output terminal voltages and the signals generated by said first comparator means for producing input signals for the tone generating circuitry of the instrument, said input signals being commensurate with variation with time of each of said transducer means output terminal voltages subsequent to said output terminal voltages having reached values commensurate with the said threshold pressure level.

4,520,707

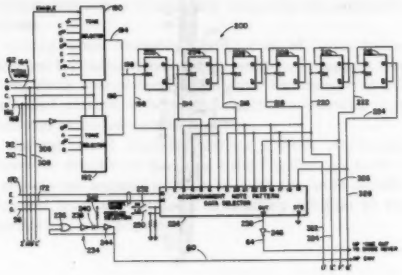
ELECTRONIC ORGAN HAVING MICROPROCESSOR CONTROLLED RHYTHMIC NOTE PATTERN GENERATION

Robert A. Weil, Jr., Dale, and Stephen L. Howell, Huntingburg, both of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Continuation of Ser. No. 358,118, Mar. 15, 1982, abandoned. This application Dec. 27, 1983, Ser. No. 565,130

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **4 Claims**



1. An electronic keyboard musical instrument comprising:

a first controllable tone generator means including a divider string for producing on an output of the divider string a selectable accompaniment tone,

a second controllable tone generator means including a divider string for producing on an output of the divider string of said second controllable means a selectable bass tone,

accompaniment note pattern generator means for controlling said first controllable means and said first divider means to automatically produce a rhythmic accompaniment pattern of a series of the accompaniment tones having respective selected frequencies,

bass pattern generator means for controlling said second controllable means to automatically produce a rhythmic bass pattern of a series of the bass tones having respective selected frequencies, and

means responsive to said accompaniment and bass pattern generator means when an accompaniment tone and a bass tone simultaneously selected, respectively, by the accompaniment and bass pattern generator means are of the same pitch and are octavely related for disabling one of said first and second controllable means and causing the other of said first and second controllable means to produce both of said octavely related tones on respective outputs of the divider string of said other controllable means.

4,520,708

TONE WAVESHAPE GENERATION DEVICE

Masatada Wachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 9, 1984, Ser. No. 598,380

Claims priority, application Japan, Apr. 11, 1983, 58-62360

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.26 **4 Claims**

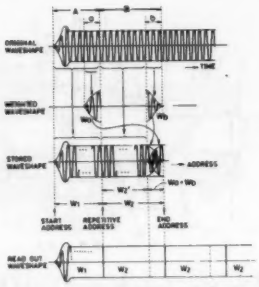
1. A tone waveshape generation device comprising:

memory means for storing,

a first waveshape of plural periods which is a first specified section of an original waveshape of plural periods, said original waveshape being a complete waveshape of a tone to be produced from beginning to end of the tone produc-

tion and said first specified section being a section from beginning to a certain point of said original waveshape to include an attack portion thereof, and

a second waveshape of plural periods which is comprised of the concatenation of a second specified section succeeding said first specified section of said original waveshape excluding a terminal portion of said second specified



section, and a terminal portion, said terminal portion being determined by adding a weighted one of a terminal portion of said first specified section and a weighted one of said terminal portion of said second specified section; and

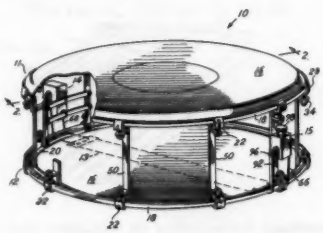
readout means for reading out said first waveshape once and thereafter reading out said second waveshape repeatedly from said memory means.

4,520,709

RIMLESS DRUM STRUCTURE WITH TUNING DEVICE

Ralph C. Kester, Jr., 1531-20th Ave. North, Lake Worth, Fla. 33460

Filed Mar. 19, 1979, Ser. No. 21,718
Int. Cl.³ G10D *13/02*
U.S. Cl. 84—415 **18 Claims**



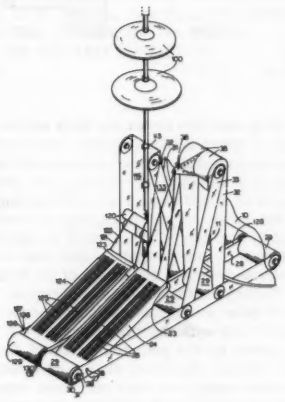
1. A rimless, shell-less dual headed drum structure with tuning means comprising upper and lower drumheads each having a drumhead membrane with an outer rigid ring attached to the periphery thereof, each of said outer rigid rings being generally U-shaped in cross section for receiving therein the edge and a portion of said membrane to which it is attached inwardly from said edge, and having an exposed lip disposed outwardly from said membrane in the tuned drum, a rigid tensioning ring for each of said drumheads being of slightly less external diameter than the internal diameter of said outer rings, each of said tensioning rings being initially positioned within one of said outer rings and moveable through said outer ring and against said membrane, a plurality of spaced attachment and adjustment devices interconnecting said outer and tensioning rings of each of said drumheads, said devices being attached to said lips of said outer rings and having means for adjustably forcing said tensioning rings above said outer rings and against said membranes, a plurality of rigid spacer members between said drumheads, and a snare device disposed on said drumheads and including a sound control adjustment device in contact with the membrane of one of said heads, a plurality of snares stretched across the other of said drumheads, a snare release mechanism and a snare tension adjustment device connected at opposite ends of said snares, said snare release mechanism and said snare tension adjustment device each being attached to one of said rigid spaced members, said snare release mechanism consisting of a shaft fixed to a fixed cam and having mounted thereon a moveable cam operably connected to said snares, wherein movement of said moveable cam causes said moveable cam to ascend and descend on said shaft to make said snares operational or non-operational.

4,520,710

DRUM AND CYMBALS PEDALS ASSEMBLY

Francis J. J. Elliott, Jr., 300 S. Forest Ave., Apt. 6, Liberty, Mo. 64068

Continuation-in-part of Ser. No. 60,132, Jul. 24, 1979,. This application Aug. 18, 1980, Ser. No. 179,872
Int. Cl.³ G10D *13/02, 13/06*
U.S. Cl. 84—422 R **17 Claims**



1. A drum pedal assembly comprising the following:

a plurality of spacer members, each being substantially cylindrical;

a plurality of frame members, each being substantially flat and symmetrical;

said frame members and said spacer members being connected so as to form a base for the assembly;

a treadle comprising a platform with longitudinal openings therein;

a live axle for pivotably supporting said treadle between at least two of the frame members;

a static axle between two other frame members;

an open-bearing cantilever mounted on said static axle;

a tension cable coupling, employed in a triangular form, for detachably connecting said treadle and said beater cantilever;

a drum beater suspended from said beater cantilever which functions as an inherent escapement means;

secondary escapement means mounted near a top extremity of said drum beater, which is itself comprised of fixture means to locate and tension an elastic band, and an elastic band;

pithy spacers mounted on said static axle on each side of said beater cantilever; and

fastening means for holding everything together.

4,520,711

LOOP RETENTION DEVICE FOR HOOK OPERATED BOMB ARMING SOLENOIDS

Paul R. Robinson, Williamstown, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

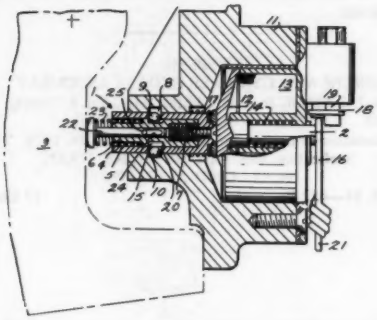
PCT No. PCT/AU82/00025, § 371 Date Nov. 10, 1982, § 102(e) Date Nov. 10, 1982, PCT Pub. No. WO82/03272, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 12, 1982, Ser. No. 448,997

Claims priority, application Australia, Mar. 13, 1981, PE7983

Int. Cl.[3] F41F 5/02; B64D 1/04

U.S. Cl. 89—1.5 D 6 Claims



6. A loop retention device for hook operated bomb arming solenoids in which hooks releasably carry the bomb, and solenoid means control an arming lanyard so that the bomb may be dropped in a safe state by releasing the arming lanyard, or dropped in an armed state to retain the arming lanyard, and in which the arming lanyard is retained on a release control pin actuated by the said solenoid which is carried by a housing, characterised by an arrangement such that when the solenoid is de-energised prior to movement of the bomb release hooks when effecting unarmed release, a telescopic push rod means having an inner member and an outer member moves back as a complete unit with the release control pin and with detent means carried by the push rod retracted, but when the said solenoid remains energised during movement of the bomb release hooks only, the inner telescopic member of the said push rod moves to urge detent means outwardly in bores in the outer telescopic member to engage the said detent means in recess means in the housing to lock the outer member and thus the armature of the solenoid and the control pin in place to prevent release of the loop on the arming lanyard.

4,520,712

AXIAL PISTON MACHINE HAVING A SEALED BEARING BOX

Reiner Hovorka, Wuppertal, and Josef Riedhammer, Horb a. Neckar, both of Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

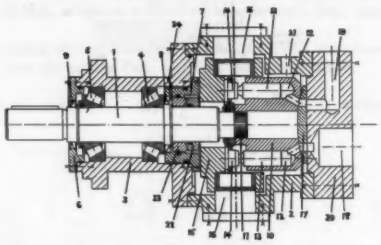
Filed Nov. 1, 1983, Ser. No. 547,566

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233579

Int. Cl.[3] F01B 13/04

U.S. Cl. 91—505 6 Claims

1. A reciprocating-piston machine of the inclined disc type, comprising a rotatable driving shaft, a drum-shaped cylinder block directly connected thereto for rotation with said shaft and arranged in a housing of the machine, cylinder bores in said block disposed in a circle around the axis of rotation of said driving shaft, longitudinally-displaceable pistons in said cylinder bores, piston shoes connected to said pistons and supported on a stationary inclined disc swivellably adjustable in the machine housing, a control plate at the end of the cylinder block remote from the inclined disc serving to connect the cylinder bores alternately to a suction duct and a pressure duct for fluid medium to be conveyed through the machine, a bearing box located outside the machine housing and surrounding an intermediate part of the driving shaft lying outside the machine housing, two spaced-apart roller bearings in the bearing box serving as the sole means of support for the driving



shaft, the cylinder block being mounted on the free end of the bearing-free portion of the driving shaft lying within the machine housing, and slide-ring sealing means adapted to seal the machine housing from the bearing box, the said sealing means including a rotating ring tightly surrounding and directly secured to the driving shaft and arranged to bear in a fluid-tight manner against a stationary ring inserted in a bush associated with the bearing box.

4,520,713

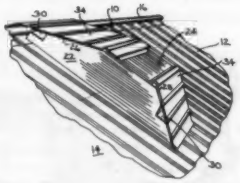
ROOF VENTILATOR

Richard Arfsten, 3031 Sheard Rd., Burlington, Wis. 53105

Filed Mar. 24, 1983, Ser. No. 478,487

Int. Cl.[3] F24F 7/02

U.S. Cl. 98—42.19 11 Claims



1. A ventilator for mounting on a building roof, said roof having a hole through which air may flow from the building, said ventilator comprising:

a pair of trapezoidal side members having parallel, straight upper and lower bases and having slanting ends, said side members being spaced from each other, and the lower bases of said side members being mountable on the roof on either side of the hole; and

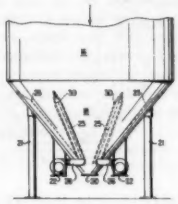
a sheet-like covering means mounted on said side members and extending across the ends and upper base of said side members to form said ventilator, said covering means having an opening along the upper bases of the side members that is flush with the plane of said sheet-like covering means,

the upward movement of air along the exterior of said covering means on said slanting ends and upper base of said ventilator creating a zone of reduced pressure over said opening that draws air out of the building through the hole in the roof and said opening in said ventilator.

4,520,714
AERATION DUCT SYSTEM

Myron L. Gullickson, P.O. Box 35, Barons, Alberta, Canada T0L 0G0

Filed Jan. 4, 1983, Ser. No. 455,558
Claims priority, application Canada, Sep. 27, 1982, 412303
Int. Cl.³ E04H 7/24
U.S. Cl. 98—56 11 Claims

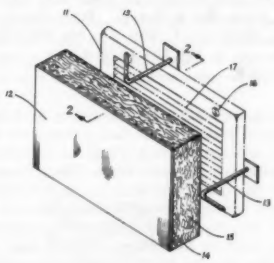


9. An aeration system for a grain bin of the type including a side wall, a top wall and a conical floor, and at least one blower for blowing air into the bottom of said bin, said system comprising a manifold for receiving air from said blower, said manifold being mounted externally of said floor, a plurality of outlet ducts inside the bin and extending upwardly along the inclined interior surface of the conical floor, each outlet duct being in fluid communication via an opening in the conical floor for receiving air from said manifold, each said duct including a pair of contiguous walls defining two adjacent sides of a triangle, the third side of the triangle being defined by part of the inclined interior surface of said conical floor when the system is installed in such bin, and a plurality of openings in said duct walls for discharging air into the bin.

4,520,715
ENERGY-SAVING COVER APPARATUS FOR ROOM AIR REGISTERS

Raymond G. Coomes, and Pamela R. Coomes, both of 10250 N. Volk, Marana, Ariz. 85238

Filed Jun. 21, 1984, Ser. No. 622,831
Int. Cl.³ F24F 7/00
U.S. Cl. 98—101 2 Claims



1. An energy-saving cover apparatus for preventing the loss of warm, room ambient air through a room air register of the type having a framework with an inner depending wall, said framework being attached to a ducting opening by attachment screws, comprising:

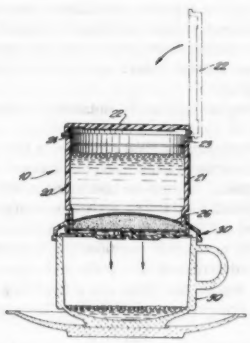
(a) a room air register cover means; and

(b) attachment means for securing said room air register cover means to said room air register, said attachment means being a clamping attachment mechanism having a pivotal cover-latching member and a register attachment member; said cover-latching member having shank portion having one end pivotally attached to said register attachment member and other end being a 90 degree bent portion for clamping to the frontside of said cover means; said register attachment member being a narrow, flat strip of sheet metal, or similar material which can be formed, having an exterior wall portion and an interior wall portion, said exterior wall portion pivotally containing one end of said shank portion and said interior wall portion having a wall bearing part and a backwardly bent parallel part terminating in a substantially small upward bend, said interior wall portion also having sufficient length to be insertable behind the framework of said register after loosening the register attachment screws and thereat be rigidly retained upon reinstalling said register attachment screws by the resulting force upon said wall bearing part and said backwardly bent parallel part with terminating bent end butting against the inner wall of said register framework.

4,520,716
DRIP-TYPE COFFEE MAKING APPARATUS

Susan M. Hayes, 11 W. 69th St., New York, N.Y. 10023

Filed Mar. 19, 1984, Ser. No. 590,604
Int. Cl.³ A47J 31/02, 31/10
U.S. Cl. 99—306 16 Claims



1. A drip-type coffee-making apparatus comprising:

a closed-wall vessel having an open top end for introducing hot water into said vessel and an open bottom end, said vessel comprising a means for closing said top end, a water distribution means extended across and fixed along its circumference to the interior wall of said vessel proximate to the bottom end, and a first attachment means at the bottom end of said vessel, and

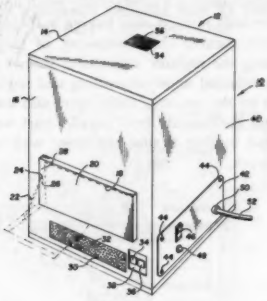
a shallow coffee-holding basket having a closed bottom and circumferential wall substantially coextensive with the wall of said vessel; said wall of said basket having a second attachment means at the top thereof which fits cooperatively with said first attachment means of said vessel to form a seal around the circumference thereof resulting in a composite water-tight walled structure,

said basket further comprising a filter-support means on the interior of said closed bottom for lining with a coffee filter, at least one drain hole in said basket bottom whereby liquid passes through said bottom, and a basket support means on the exterior of said closed bottom whereby said basket and, thus, said composite structure is supported on the rim of the opening of a coffee receptacle.

4,520,717
FOOD FRYING APPARATUS

Walter G. Bohrer, Jr., Big Bend, Wis., and Kenneth H. Stamps, Garland, Tex., assignors to Alpaire, Inc., Garland, Tex.

Filed Aug. 8, 1983, Ser. No. 520,325
Int. Cl.[3] A47J *37/12*
U.S. Cl. 99—337 17 Claims



1. Food frying apparatus adapted for use in an enclosed space without connection to an outside exhaust system, said apparatus comprising:

a cabinet adapted to be supported at a suitable working height and having a top panel, side panels, a rear panel and a front panel, at least one of said panels being configured to allow access to the interior of said cabinet;

a container, located in said cabinet, for holding a supply of cooking oil;

means, integral with said container, for heating said container;

means for supporting food products in the cooking oil during the cooking of said food products;

blower means, located in said cabinet, for circulating air through said food frying apparatus along a predetermined path and exiting at a predetermined location; and

a filter unit removably positionable, as a one-piece unit, in said predetermined air path and upstream from said blower means, said filter unit comprising:

a solid bottom portion having a first side and a second side;

a paper housing element with opposed first and second open ends and having a predetermined inside diameter and a predetermined outside diameter, said paper housing element having said first open end resting against said first side of said solid bottom portion;

a housing element with opposed first and second open ends and having a predetermined inside diameter and a predetermined outside diameter, said predetermined outside diameter being smaller than said predetermined inside diameter of said paper housing element, said housing element including air passage means formed in the wall thereof, said housing element having said first open end thereof resting against said first side of said solid bottom portion, said housing element being positioned to be coaxial with said paper housing element;

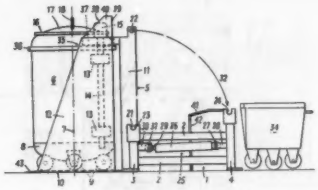
a top portion having an aperture formed therein, said top portion being positioned such that said aperture is coaxial with said paper housing element and said housing element and supporting said second ends of said paper housing element and said housing element; and

a predetermined amount of charcoal positioned in the volume formed by said solid bottom portion, said top portion, said paper housing element and said housing element to substantially fill said volume.

4,520,718
EQUIPMENT FOR MASSAGING OF MEAT

Otto Prosenbaiier, Vienna, Austria, assignor to Inject Star Pökelmaschinen Gessellschaft m.b.H., Vienna, Austria

Filed May 22, 1984, Ser. No. 612,823
Claims priority, application Austria, May 27, 1983, 1957/83
Int. Cl.[3] A23B *4/02*
U.S. Cl. 99—535 20 Claims



1. Equipment for massaging meat comprising:

an axially symmetric container having an axis, a sidewall, a top, an access opening at the top, a bottom, and a removable cover for closing the access opening, the container being supportable in an upright orientation by wheel means at the bottom;

a support frame for receiving and supporting the container;

support frame positioning means for positioning the support frame in an upright position, a first tilted position and a second tilted position;

the support frame having an open side and a frame bottom for rolling the container onto and off of the frame bottom when the support frame is in its upright position and the container is in its upright orientation;

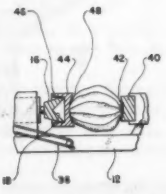
roller means, mounted to the frame, for rotatably and supportably engaging the container sidewall when the support frame and container therewith is in the first tilted position with the wheel means rotatably engaging the frame bottom; and

means for driving the container about the container axis when the support frame and container therewith is in the first tilted position.

4,520,719
NUTCRACKER FOR CRACKING HARD-SHELL NUTS SUCH AS BLACK WALNUTS AND MACADAMIA NUTS

William M. Price, Rte. 4, Box 226, Wake Forest, N.C. 27587

Filed Apr. 7, 1980, Ser. No. 138,183
Int. Cl.[3] A23B *4/04*
U.S. Cl. 99—578 2 Claims



1. In a nutcracker of the type having an anvil and an aligned impact member with said anvil and impact member adapted for rectilinear movement relative to each other and further adapted to receive and hold a nut therebetween for cracking; an impact means for striking said impact member and cracking the shell of the nut held between said anvil and impact member in response to said impact means being cocked and released and striking said impact member; the improvement comprising an adaptation unit for cracking hardshelled nuts such as black walnuts and macadamia nuts, said adaptation unit comprising a

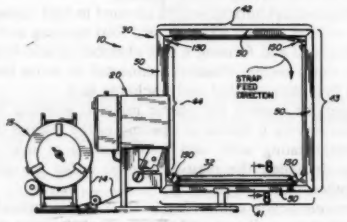
second impact member having an open hollow center portion for receiving the other impact member such that said second impact member can be easily inserted over the other impact member; said second impact member including a generally flat and shallow, dish-like and slightly rounded nut receiving recess means formed about an end thereof for receiving a hard-shelled nut wherein said nut receiving recess means forms a dish-like depression having a nut engaging surface for directly engaging and surrounding a substantial portion of a nut shell such that the nut shell engaged is continuously surrounded about a substantial area by the nut engaging surface of said second impact member; a second anvil adapted to replace said first anvil and to cooperate with said second impact member for cracking a hardshelled nut, said second anvil including a nut receiving recess means shaped as said nut receiving means of said second impact member such that said second anvil is effective to impart a cracking force to a substantial portion of a nut held therebetween.

4,520,720

STRAP CHUTE FOR AUTOMATIC STRAPPING MACHINE

Clement A. Urban, Willow Springs, and Gale W. Huson, Glenview, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed May 11, 1983, Ser. No. 493,676
Int. Cl.³ B65B *13/04*
U.S. Cl. 100—26 **15 Claims**



1. A strap chute for an automatic strapping machine in which a strap is fed to form a loop around an article to be strapped, in which the strap is then tightened around the article, and in which the strap is subsequently joined at overlapping portions in the tight loop, said strap chute comprising a plurality of sections for being joined together with said machine to define a path along which said strap is guided as the strap is fed in said loop, each said section including

(a) a mounting frame having a pair of opposed fulcrum members each defining a fulcrum spaced from the other fulcrum;

(b) a pair of strap guides each having at least an outer retaining wall for guiding and retaining said strap when said strap guides are located in a closed position wherein said outer retaining walls are in close approximation, each said strap guide having a lever member disposed adjacent one of said fulcrum members in an unpinned relationship to accommodate pivoting movement of said strap guides between said closed position and an open position displaced from said closed position wherein said strap guide outer retaining walls are spaced apart an amount sufficient to accommodate the passage of said strap therepast when said strap is tightened; and

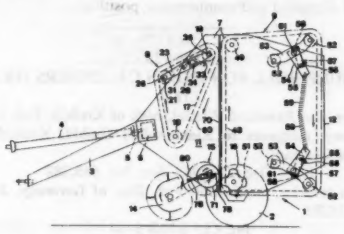
(c) biasing means disposed in compression between said strap guide lever members for continuously subjecting said strap guide lever members to outwardly directed forces for biasing each said strap guide lever member against one of said fulcrum members and for pivoting said lever members so as to normally maintain said strap guides in said closed position whereby, after said strap loop is formed, the tightening of said strap causes said strap to bear against said strap guide outer retaining walls and pivot said strap guides into said open position to release said strap.

4,520,721

ROUND BALER WITH VERTICALLY ORIENTED START CHAMBER

Frans J. G. C. DeCoene, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Mar. 27, 1984, Ser. No. 594,004
Claims priority, application United Kingdom, Mar. 29, 1983, 8308563
Int. Cl.³ B30B *5/06*; A01D *39/00*
U.S. Cl. 100—88 **11 Claims**



1. A round baler comprising:

(a) a base frame;

(b) side walls attached to said base frame;

(c) first and second expandable members arranged to define together with said side walls an initial generally vertically oriented wedge-shaped start chamber which expands to a generally cylindrical shape during bale formation;

(d) an arm supporting said first expandable member, said arm being pivotally mounted on at least one of said side walls and carrying guide members at the ends thereof around which said first expandable member passes; and

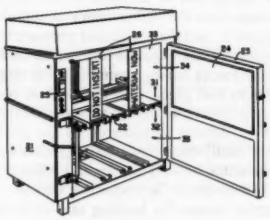
(e) upper and lower T-shaped supports supporting said second expandable member, each said T-shaped support being pivotally mounted on at least one of said side walls and carrying a pair of guide members for engaging said second expandable member.

4,520,722

SAFETY AND WARNING DEVICES FOR BALING PRESSES

Albert Goldhammer, Zum Hecht 46, 7770 Überlingen, Fed. Rep. of Germany

Division of Ser. No. 198,163, Oct. 17, 1980, Pat. No. 4,430,934. This application Feb. 10, 1984, Ser. No. 578,843
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1979, 2942219; Oct. 18, 1979, 2942228
Int. Cl.³ B30B *1/18*
U.S. Cl. 100—99 **26 Claims**



1. In a baling press having a housing defining a filler opening and a working space, and a press piston movable in the work-

ing space between a retracted position and a compressing position wherein a bale is compressed, said piston dividing the working space into a press space and a movement space, warning means comprising:

elongated flexible means attached to the piston,

means mounted on the housing and engaging the elongated flexible means for extension thereof between an edge of said filler opening and the piston to provide warning to an operator against inserting material through the filler opening, and

said engaging means comprising tensioning means engaging the elongated flexible means to maintain the elongated flexible means taut at all positions of the piston between said retracted and compressing positions.

4,520,723

PRESSURE ROLL FOR USE IN CALENDERS OR THE LIKE

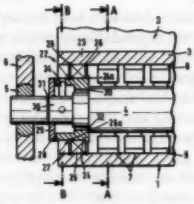
Josef Pav, and Reinhard Wenzel, both of Krefeld, Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Dec. 27, 1983, Ser. No. 565,282

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325385

Int. Cl.³ B30B *3/04*

U.S. Cl. 100—162 B **32 Claims**



28. In a machine of the character indicated, particularly in a calender, the combination of first and second pressure rolls defining a nip and having axes normally disposed in a common supporting plane, at least one of said rolls comprising a stationary carrier; a hollow rotary cylindrical shell surrounding said carrier and having first and second end portions movable in said plane radially of the other of said rolls; groups of supporting elements installed in the interior of said shell and being spaced apart from one another, as considered in the axial direction of said shell, each of said groups including at least two supporting elements spaced apart from one another, as considered in the circumferential direction of said shell, and each of said supporting elements comprising a plurality of pressure transmitting units disposed next to each other, as considered in the circumferential direction of said shell, said shell being subject to the action of external forces having components acting at least upon the end portions of said shell substantially at right angles to said plane and said pressure transmitting units being operable to react against said carrier and transmit to said shell internal forces having components acting substantially at right angles to said plane; first and second bearing units each comprising a spherical joint and each including an annular inner bearing element surrounded by the respective end portion of said shell, each inner bearing element being radially movably mounted on said carrier and being arranged to transmit axial stresses from the respective end portion of said shell to said carrier; means for holding said inner bearing elements against rotation with said shell; and regulator means for operating said pressure transmitting units so as to effect the generation of internal forces whose components at least substantially neutralize the components of said external forces to thus maintain the axes of the end portions of said shell in said plane.

4,520,724

SCREW DRIER PARTICULARLY FOR PLASTIC MATERIALS

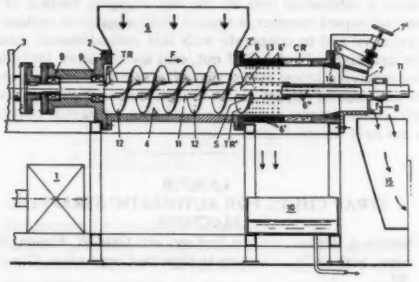
Edoardo Costarelli, Via F. Lli Pellas, 34, Perugia, Italy (06100)

Filed Sep. 22, 1982, Ser. No. 421,165

Claims priority, application Italy, Aug. 18, 1982, 49003 A/82

Int. Cl.³ B30B *9/16*

U.S. Cl. 100—935 **8 Claims**



1. A tunnel drier for waste plastic materials in small particles comprising:

a drier casting having a feed opening;

an elongated cylindrical walled channel in said casing having an inlet section adjacent said feed opening and a discharge end and forming a first chamber in said inlet section and a second chamber connected in series between said first chamber and said discharge end;

a hopper for feeding the plastic material attached to said casing having a discharge opening in the bottom thereof communicating with said feed opening in said casing through which the plastic material is fed to said first chamber;

a screw conveyor comprising a shaft and a helical vane mounted coaxially on said shaft, said shaft being solid in the portion thereof in said first chamber and hollow downstream thereof;

means to rotatably support said shaft coaxially in said channel at the upstream end thereof adjacent said inlet section;

means to rotate said shaft;

a plurality of liquid outlet holes in said shaft in the portion thereof between substantially the center of said second chamber and said discharge end;

said helical vane extends continuously through said first chamber and has a laminar blade shape in said first chamber and a final turn extending into said second chamber a distance of substantially one turn, said final turn having the same radius as the preceding turn and a cross-sectional configuration in the form of a right triangle so that the downstream surface of said final turn forms an oblique helicoid which imparts to the material being treated a pressure which increases from the outer periphery of the final turn to the shaft;

a half-turn segment of a laminar helical vane for breaking up the material having the same pitch as said first-mentioned vane and a radial height from said shaft approximately one-half the radial height of said first vane mounted on said shaft so that its upstream end is at substantially the same angular position as the downstream end of said final vane but displaced upstream therefrom substantially a distance of a half-pitch;

a plurality of liquid outlet holes through the wall of a first upstream portion of said second chamber;

heating means incorporated in the wall of a central portion of said second chamber to facilitate drying of the material passing therethrough;

means for resisting flow of the material to produce a high pressure region in said second chamber between the

downstream end of said helical vane and said discharge end; and

a device operatively mounted on said discharge end for adjusting the area of said discharge end.

4,520,725
SETTING MECHANISM FOR TYPE WHEELS OF A PRINTING DEVICE

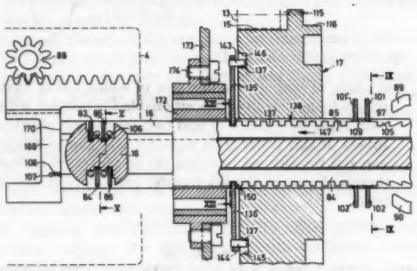
Werner Haug, Langnau, Switzerland, assignor to Frama AG., Switzerland

Filed Sep. 28, 1983, Ser. No. 536,763

Claims priority, application Switzerland, Oct. 4, 1982, 5827/82

Int. Cl.³ B41L *47/46*; B41J *1/34*

U.S. Cl. 101—91 **18 Claims**



1. A setting mechanism for a printing device having a plurality of rotatably mounted type wheels each with a pinion connected thereto, comprising:

a support;

at least one push rod associated with one of the pinions, mounted for reciprocal movement to said support for rotating the one pinion by an incremental amount in stepwise fashion to change a type on the type wheel connected to the one pinion during each reciprocation;

an electromagnet connected to said support and having a movable part engaged with said at least one push rob for reciprocally moving said at least one push rod;

said support including a fixed part and a guide plate pivotally mounted to said fixed part, said at least one push rod mounted for reciprocal movement on said guide plate; and

an additional electromagnet connected to said fixed part and engageable with said guide plate for moving said guide plate between a first position in which said at least one push rod is effective to move the one pinion, and a second position wherein reciprocal movement of said push rod has no effect on the one pinion.

4,520,726
FLAT SILK-SCREEN PRINTING MACHINE WITH MOVABLE PIVOTED SUPPORT

Eric Rouly; Philippe Baquet, and Jean-Louis Dubuit, all of Paris, France, assignors to Societe d'Exploitation des Machines Dubuit, Paris, France

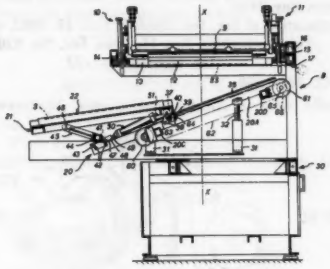
Filed Oct. 18, 1982, Ser. No. 434,860

Int. Cl.³ B41L *13/02*; B41F *15/26*

U.S. Cl. 101—123 **11 Claims**

1. A silk-screen printing machine for printing substrates lying flat, said printing machine comprising a machine frame supporting a screen in a substantially horizontal position, ink-applying blade and an ink-wiping blade moveably mounted on said machine frame for alternately sweeping across said screen, a flat table for receiving a substrate to be printed, wherein the improvement comprises:

a fixed inclined table support generally underlying said screen, means mounting said table on said inclined table support for reciprocatory movement along said table support between a lowered, retracted, access position projecting beyond said machine frame and outwardly of said table support at one side of said screen and a raised, advanced, printing position underlying and aligned with said screen; means for pivotally mounting said table on said table support for movement between a sloping condition at said access position and a substantially horizontal



condition parallel to said screen at said printing position; and control means for controlling movement of said table between said raised, advanced, printing position with said table being parallel to and immediately below said screen, and said lowered, retracted, access position for introducing and removing the substrate with a greater part of said table clearing said machine for enhanced acess.

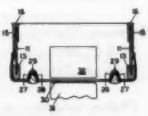
4,520,727
METHOD AND APPARATUS FOR SILK-SCREEN PRINTING

Henry L. Miller, Mars, Pa., assignor to Miller Screen & Design, Inc., Mars, Pa.

Filed Mar. 12, 1984, Ser. No. 588,501

Int. Cl.³ B05C *17/06*; B07B *1/48*

U.S. Cl. 101—127 **8 Claims**



1. In a method of applying decorative imprints to the surfaces of workpieces, the steps of:

forming on a stencil screen a paint-impervious layer having a paint-pervious opening therein defining a desired pattern to be imprinted,

forming a resilient membrane including establishing a pocket in said stencil screen by reversely-bent portions thereof between said desired pattern and edge portions of said stencil screen.

filling said packet with a curable eastomer,

curing said elastomer,

securing to a frame the stencil screen by said edge portions, and

stretching said resilient membrane while transferring paint

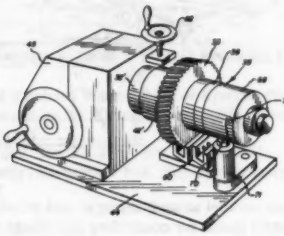
through said desired pattern onto the surface of a workpiece.

4,520,728

METHOD OF OPERATING A PRINTING PRESS AND APPARATUS

Harold Ecker, DePere, and Harvey J. Spencer, Green Bay, both of Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Continuation of Ser. No. 350,627, Feb. 22, 1982, abandoned.
This application Jun. 15, 1984, Ser. No. 620,539
Int. Cl.³ B41F *13/12*
U.S. Cl. 101—248 15 Claims



1. In a method of achieving rotary registration in a press having a helical gear-equipped central impression cylinder and at least two helical gear-equipped plate cylinders, the steps of:

(a) providing a positioning fixture separate from the press;

(b) sequentially mounting each plate cylinder gear on the positioning fixture;

(c) orienting each plate cylinder gear relative to a first reference on the positioning fixture which corresponds to a reference on the associated plate cylinder while the plate cylinder gear is mounted on the positioning fixture;

(d) orienting at least one of the plate cylinder gears and said first reference on the positioning fixture relative to a second reference on the positioning fixture which corresponds to a reference on the press to provide a desired phase angle between said one plate cylinder and the other plate cylinder; and

(e) mounting the gear-equipped plate cylinders on the press and moving the plate cylinder gears radially into engagement with the impression cylinder gear.

4,520,729

INKER FOR ROTARY PRINTING MACHINE, AND METHOD

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 575,856
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1983, 3303988
Int. Cl.³ B41F *31/36*; B41L *27/32*
U.S. Cl. 101—352 5 Claims

1. Inker for a rotary printing machine having

a plate cylinder (10);

a ductor roller (1) and a doctor blade associated therewith;

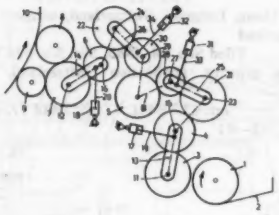
at least one ink application roller (8, 9) in ink transmitting contact with the plate cylinder;

and an ink transfer roller train in ink transferring relation between the ductor roller (1) and the at least one application roller (8, 9), including a plurality of rollers in a serial path—in the direction of ink transfer—between the ductor and the at least one ink application roller,

the ink transfer roller train including two rollers (4, 5; 6, 5) which are selectively positionable for surface engagement with each other, or for disengagement, and, when disengaged, defining a gap therebetween;

and comprising

at least one pair of auxiliary or additional ink transfer rollers (21, 28; 22, 30) selectively engageable in serial, ink transfer position within the serial path of the rollers of the ink roller train;



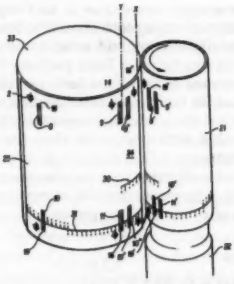
one, each, of said at least one pair of additional or auxiliary rollers being selectively positionable for contact with one each respective roller of said two selectively positionable rollers of said roller train adjacent said gap to bridge the gap and transfer ink between the so separated rollers and thereby lengthen the ink transfer path through the roller train.

4,520,730

PRESETTING PROCESS FOR PRINTING CYLINDRICAL OR CONICAL ARTICLES

Gilbert Edelmann, Lausanne, Switzerland, assignor to Cebal, Clichy, France

Filed Nov. 10, 1982, Ser. No. 440,549
Claims priority, application Switzerland, Dec. 8, 1981, 7831/81
Int. Cl.³ B41C *1/00*
U.S. Cl. 101—426 6 Claims



1. A process for presetting a dry offset printing machine intended for printing cylindrical or conical workpieces and for setting corresponding working blocks, said process comprising the steps of:

(a) preparing a base matrix film by disposing on a film a plurality of spaced reference crosses and two axes forming an angle of from 80° to 100° with one another;

(b) making an enriched matrix film by disposing a plurality of alignment bars on a copy of the base matrix film;

(c) making a master template from the enriched matrix film;

(d) making a plurality of secondary templates which are identical with one another and with the base matrix film;

(e) making four perforations on the master template and on each of the plurality of secondary templates, corresponding perforations on each of the templates being located in

corresponding places on each of the templates, two of the perforations being located on one of the two axes mentioned in step (a) and the other two of the perforations being located on the other of the two axes mentioned in step (a);

(f) making working blocks from copies of the base matrix film by forming four perforations therein corresponding to the four perforations mentioned in step (e) on each copy and engraving thereon axes corresponding to the axes mentioned in step (a);

(g) placing the master template on the first quadrant of a dry offset printing machine and inking it up;

(h) making a pass with a blanket and a test specimen, thereby printing images of the reference crosses and the alignment bars on the test specimen and redepositing images of the reference crosses and the alignment bars on the blanket;

(i) adjusting the positions of the master template by checking the positons of the images of the alignment bars on the test specimen and the blanket;

(j) placing the secondary templates on subsequent quadrants of the dry offset printing machine and inking them up;

(k) making a pass over the blanket and the test specimen, thereby printing images of the reference crosses mentioned in step (a) on the test specimen and redepositing images of the reference crosses on the blanket;

(l) adjusting the positions of the secondary templates to ensure that the images of the reference crosses on the blanket coincide with the images of the reference crosses on the master template;

(m) marking each quadrant of the dry offset printing machine through the perforations with reference marks aligned with the axes mentioned in step (a);

(n) removing the templates from the dry offset printing machine;

(o) drawing axes corresponding to the axes mentioned in step (a) on each quadrant on the dry offset printing machine by connecting the reference marks mentioned in step (m); and

(p) placing each working block in position by superposing the axes engraved on each working block on the corresponding axes marked on the corresponding quadrant of the dry offset printing machine.

4,520,731

PROJECTILE CONSTRUCTION AND METHOD OF MAKING THE PROJECTILE

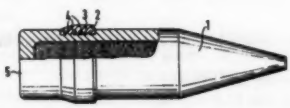
Udo Götz, Trossingen; Winifred Gleichauf, Oberndorf, and Oswin Günther, Schramberg, all of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Oct. 20, 1982, Ser. No. 435,500

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142636

Int. Cl.³ F42B *31/00*

U.S. Cl. 102—527 **4 Claims**



1. A projectile, particularly for automatic rapid firearms and high performance machine guns, comprising:

a projectile body having a projectile jacket surface, said protective body having a circular groove therearound near a rear end of said projectile body, said circular groove having opposite radially extending walls perpendicular to said projectile jacket surface, said circular groove having a bottom extending between said walls;

a plastic rotating band anchored in said circular groove;

at least two spaced apart narrow ribs extending outwardly from said circular groove bottom, each of said ribs having a pair of parallel side walls extending at an acute angle to a radial perpendicular direction parallel to said walls and defining an intermediate groove therebetween, a width of each of said narrow ribs being at most equal to a width of said intermediate groove and being less than a length of each rib from said groove bottom toward said projectile jacket surface, each rib extending at most to a plane containing said projectile jacket surface; and

knurls formed on said intermediate groove.

4,520,732

AMUSEMENT RIDE

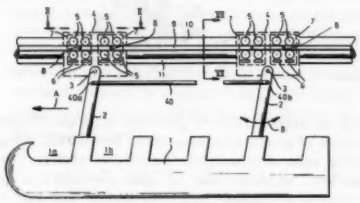
Anton Schwarzkopf, Von-Heidenheim-Str. 5, 8909 Münsterhausen, Fed. Rep. of Germany

Filed Jun. 24, 1983, Ser. No. 507,898

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1983, 3303279

Int. Cl.³ A63G *21/04*

U.S. Cl. 104—53 **20 Claims**



1. An amusement ride comprising:

rail means defining a closed travel path;

at least one carriage provided with running rollers and guide rollers riding on said rail means;

at least one strut extending downwardly from said carriage swingably mounted thereon for pendulous movement relative to said carriage;

a vehicle fixed to said strut below said carriage whereby said vehicle is suspended from said strut, said carriage comprising a frame, a yoke spanning said frame in a direction transverse to the direction of travel of said vehicle along said path, and means for suspending said strut from said yoke; and

at least one pair of air springs in the form of bellows cylinders braced between opposite sides of said strut and said yoke for damping angular oscillations of said strut.

4,520,733

GUIDE RAIL AND FOLLOWER WHEEL CONSTRUCTION FOR MONORAIL

Claude Willmann, Morschwiller-le-Bas, France, assignor to Societe Anonyme Dite: Etablissements Tourtellier S.A., France

Filed Jun. 28, 1982, Ser. No. 392,755

Claims priority, application France, Jul. 1, 1981, 81 13072

Int. Cl.³ B61B *3/02*; E01B *25/22*

U.S. Cl. 104—93 **12 Claims**

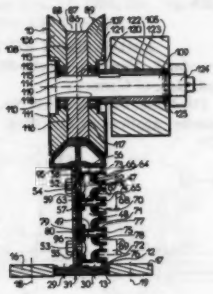
1. A system for transporting loads, the system being of the type including a series of guide rails with horizontal sections and sloping sections, wherein each guide rail has a support portion and at least one track portion situated above it, and vehicle means supported by and guided along said rails for carrying the loads characterized in that:

the guide rail has an upper tubular angle bar, a perfectly gauged lower flat angle bar situated below, and an upright center web connecting the upper and lower bars, the guide rail being composed of an extruded material, the center web having fasteners and catches on a surface thereof;

insulating angle bars secured by said fasteners and catches and outfitted with electric power lines;

vertically turning guide wheels on the vehicle means;

the lower angle bar being demarcated by two parallel, vertical edges constituting tracks for the rollers, the lower angle bar having an upper surface with two lengthwise grooves therein, the upper surface having parallel shoulders projecting upwardly, each of said grooves being situated between two parallel shoulders, and which function as stops for the top portions of means of attachment, means of attachment adapted to be inserted along predefined axes, and at least one further groove in said top surface, adjacent one of said shoulders a fish-plate mounted in contact with said center web and having a longitudinal edge dimensioned to fit in said further groove, and the lower angle bar having a lower surface containing incisions, with said incisions being situated within the same vertical plane as the axes along which means of attachment are inserted.



4,520,734

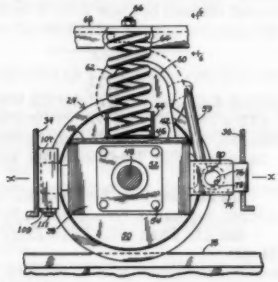
SHORT DISPLACEMENT DOUBLE ACTING VEHICLE SUSPENSION SYSTEM

Charles R. Herron, Bluefield, Va., assignor to Baker International Corp., Orange, Calif.

Filed Aug. 17, 1983, Ser. No. 524,002

Int. Cl.³ B61F *5/16, 5/30*

U.S. Cl. 105—157 R **5 Claims**



1. In a vehicle, a frame, an axle assembly having an axle housing with a wheel supporting axle rotatably journaled therein, wheels at the ends of said axle, improved short displacement double acting ride suspension means comprising:

separate connecting means, at fore-and-aft ends of the axle assembly, enabling rocking movement of the axle assembly relative to the frame about a longitudinal axis extending generally longitudinally of the direction of movement of the vehicle;

one of said fore-and-aft ends of the axle assembly being a hinged end and the other being a tiltable end;

the connecting means at the hinged end of the axle assembly including a universal joint connection to the frame enabling unrestricted tilting, swinging and rocking movement of the axle assembly about the universal joint connection in all directions with respect to the frame;

the connecting means at the tiltable end of the axle assembly including first and second interengaging guide means on the axle assembly and frame respectively enabling free vertical movement of said tiltable end of the axle assembly while restraining horizontal movement thereof; and

a pair of springs carried between the frame and the axle assembly at opposite sides thereof, each spring being deflectable in a vertical direction under loads applied to the spring by the axle assembly, with the line of action of the spring being generally through the axle, whereby under stable load conditions, such as occur when the vehicle is traveling over flat, regular track, substantially the entire weight of the frame bearing on the axle assembly is borne by the springs and when shocks are applied to the axle assembly, such as occurs when the vehicle is traveling over irregular track, the springs acting together with the connecting means support the frame; and

the springs and the universal joint connection thus provide a stable, cushioned, three-point support for the frame; whereby shocks applied to the axle assembly through the wheels are absorbed by unrestricted rocking movement of the axle assembly about said longitudinal axis accompanied by up and down tilting movement of the axle assembly about said universal joint connection within a range permitted by said springs.

4,520,735

CONVERTIBLE RAIL-HIGHWAY MAINTENANCE VEHICLE

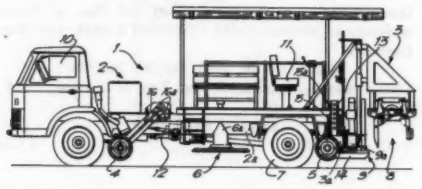
Keith C. Field, Bedford, England, assignor to Matisa (U.K.) Limited, Bedford, England

Continuation of Ser. No. 152,807, May 23, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,722

Claims priority, application United Kingdom, May 25, 1979, 7918266

Int. Cl.³ B61D *15/00*; B61F *9/00*; E01B *27/16*

U.S. Cl. 105—215 C **2 Claims**



1. A convertible highway/rail tamper, comprising:

a chassis;

an engine on said chassis;

front and rear highway wheels; suspension means mounting said highway wheels on said chassis for limited movement relative to the chassis;

front and rear rail wheels, said front rail wheels being mounted on said chassis for movement between a retracted position when the vehicle is in a highway going condition and an extended position for engaging track rails when the vehicle is in a rail going condition;

a turntable-jacking means movable mounted on said chassis for movement from a normally retracted position to an extended position for supporting the vehicle with said highway wheels spaced above the track rails during transfer between a highway and track rails;

slides fixed to said chassis;

a sub-frame vertically slidable on said slides, said sub-frame carrying for sliding movement therewith tamping apparatus which includes two jacks disposed on respective sides of said chassis, each jack having a jack body fixed to said sub-frame and a foot extendable from said jack body, said rear rail wheels also being mounted on said sub-frame for sliding movement therewith so as to be movable, when said chassis is supported on said turntable jacking means and said feet have been extended into the engagement with ground beside the track rails, from a retracted position to an extended position only by sliding movement of said sub-frame down said slides on relative retraction of the bodies and feet thereof, said front and rear rail wheels when moved to the extended position supporting the vehicle in the rail going condition in which the highway wheels are out of contact with the track rails; and

first and second drive means connected to said engine and at least some of said highway wheels and at least some of said rail wheels and selectively engageable for transmitting power from the engine to at least some of the highway wheels and to at least some of the rails wheels.

4,520,736

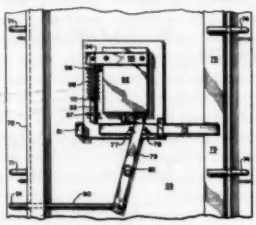
LIGHTWEIGHT SAFE AND DOOR MECHANISM THEREFOR

Gaius P. Crosby, Orem, Utah, and Thomas A. James, 341 S. Main, Mapleton, Utah 84663, assignors to Thomas A. James, Mapleton, Utah

Filed May 6, 1983, Ser. No. 492,499

Int. Cl.³ E05B *63/00*; G05B *63/18*

U.S. Cl. 109—60 **8 Claims**



1. A lightweight safe having a hinged door recessed in an offset door frame, said safe comprising:

a box-like structure having a marginal front face, a full back panel parallel to said front face, vertical side panels and top and bottom panels perpendicular to said front face and joining said back panel to said front face to form an open box-like structure;

a plurality of hinges along one vertical edge of said door to attach said door to said door frame adjacent said marginal front face;

a door having a face panel to which hinges are attached along one edge and vertical panels on the inside of said door, said vertical panels perpendicular to said door face panel; and

a first lock mechanism comprising:

a plurality of fixed studs attached along one edge vertical panel of said door and spaced inwardly of said hinges whereby said studs recess behind said door frame when said door is in a closed position,

a plurality of sliding bolts located along the non-hinged vertical edge of said door, said sliding bolts positioned to slide behind the door frame when the door is closed. said sliding bolts pass through openings in a vertical edge panel of said door,

a vertical, movable bolt-bar located within the box-like structure on the inside of the vertical edge panel through which the sliding bolts pass, said bar attached to the proximate ends of said sliding bolts, and

an actuator mechanism to cause said bolt-bar to reciprocate, thereby causing said sliding bolts to slide behind said door frame and retract therefrom, said actuator comprising:

a horizontal movable locking shaft attached to an inside edge of said vertical bolt-bar, said locking shaft having a pair of roll pins protruding from the side of the shaft and protruding towards the interior of said safe, said roll pins spaced apart a predetermined distance, said pins being of sufficiently light construction that significant shear forces applied thereto will cause shearing of said pins,

a lock-actuated bolt to hold said locking shaft securely in a locked position whereby the movable locking shaft is in a position such that the vertical bolt-bar causes the sliding bolts to protrude from the panel and position themselves securely behind the door frame when the door is closed, and

handle means attached to a substantially vertically disposed, swingable handle lever located on the inside of said front face of the door, said lever disposed between said spaced roll pins on said locking shaft whereby said lever swings away from a substantially vertical position to a position at a sufficiently acute angle to a vertical position to move the locking shaft to a locked position.

4,520,737

PROCESS AND REACTOR FOR THE COMBUSTION OF CARBON-CONTAINING FUEL

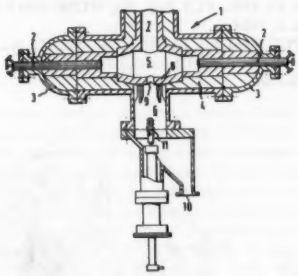
Matheus M. van Kessel, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 22, 1984, Ser. No. 582,516

Claims priority, application Netherlands, Mar. 16, 1983, 8300950

Int. Cl.³ F23J *1/02*

U.S. Cl. 110—171 **9 Claims**



1. A process for the combustion of a carbon-containing fuel with an oxygen containing gas comprising:

reacting the fuel and gas in a reaction zone;

removing the products of combustion from the top of the reaction zone;

discharging the slag by gravity from the reaction zone to a cooling zone through an opening in a partition separating the reaction and cooling zones;

cooling and solidifying the slag in the cooling zone; and

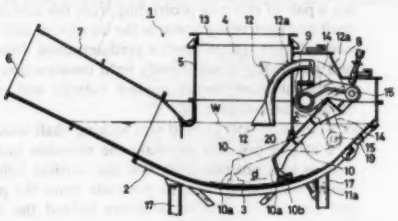
maintaining the opening in the partition clear by periodically vertically moving a cylindrical member upwardly through said opening and then retracting said cylindrical member downwardly from said opening.

4,520,738

DEVICE TO FORCE OUT INCINERATION ASH

Nobuo Takehara, Nishinomiya, Japan, assignor to Kabushiki Kaisha Takuma, Japan

Filed Jun. 19, 1984, Ser. No. 622,346
Int. Cl.[3] F23J *1/02*
U.S. Cl. 110—171 8 Claims



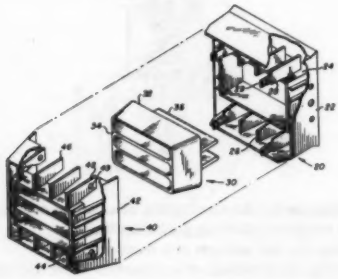
1. A device to force out the incineration ash comprising a main body case provided with an ash receiving chamber in which water is filled, an inlet opening for the incineration ash discharged out of a refuse incinerator and an outlet opening for the incineration ash after burning is extinguished; a main shaft installed horizontally in the rear part of the inlet opening of the main body case and supported so as to be able to turn; a driving mechanism to make the aforementioned main shaft turn in the positive and inverse directions at a fixed angle; a pusher installed on the aforementioned main shaft by means of a lever to force out the incineration ash settled on the bottom of the ash receiving chamber; and a pressing plate installed on the aforementioned main shaft by means of an arm to force down the matter floating on the water surface in the ash receiving chamber into the water.

4,520,739

NOZZLE TIP FOR PULVERIZED COAL BURNER

Michael S. McCartney, Bloomfield; Roman Chadshay, Windsor, and Richard F. Erlacher, Simsbury, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

PCT No. PCT/US82/00940, § 371 Date Sep. 13, 1982, § 102(e) Date Sep. 13, 1982, PCT Pub. No. WO84/00314, PCT Pub. Date Feb. 2, 1984
PCT Filed Jul. 12, 1982, Ser. No. 555,462
Int. Cl.[3] F23D *1/00*
U.S. Cl. 110—263 13 Claims



1. A nozzle tip for a burner on a pulverized fuel-fired furnace for receiving a stream of pulverized fuel and air discharging from the burner and directing said pulverized fuel and air stream into the furnace, comprising:

a. a hollow, open-ended base body adapted to be mounted to the discharge end of the burner having an outer shell and an inner shell disposed substantially coaxially in spaced relationship within the outer shell so as to define a first flow passage through the interior of the inner shell and a second flow passage through the annular space between the inner and outer shells;

b. a replaceable, hollow, open-ended end cap removably mounted to said base body at the discharge end thereof and having an outer shell and an inner shell disposed substantially coaxially in spaced relationship within the outer shell so as to define a first flow passage through the interior of the inner shell and a second flow passage through the annular space between the inner and outer shells; and

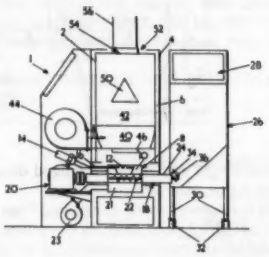
c. a replaceable, hollow, open-ended insert of a highly abrasion resistant material disposed intermediate of said base body and said end cap and retained in position therebetween by said base body and said end cap, said insert having an inlet end mating with an abutting against the discharge end of the inner shell of said base body and an outlet end mating with and abutting against the receiving end of the inner shell of said end cap, said insert defining a highly abrasion resistant flow conduit through the nozzle tip from the discharge end of the first flow passage of said base body to the receiving end of the first flow passage of said end cap through which the pulverized fuel and air stream passes from the burner into the furnace.

4,520,740

COMBUSTION AND HEATING EQUIPMENT

Brian M. Carpenter, Cheltenham, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Mar. 21, 1983, Ser. No. 477,439
Claims priority, application United Kingdom, Apr. 20, 1982, 8211373
Int. Cl.[3] F23K *3/10*
U.S. Cl. 110—288 9 Claims

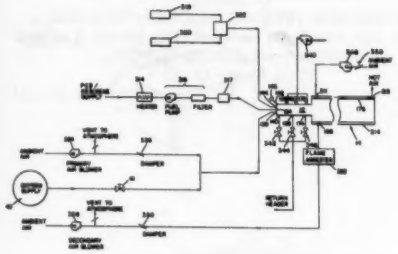


1. Combustion and heating equipment including a body having a lower part, a flue extending from said body an underfeed stoker located in said lower part, the stoker including a retort and a screwfeeder extending through the body to an inlet means, the screwfeeder incorporating a screw flight to reverse hand, a drive arrangement for the screwfeeder at one end thereof and a mobile fuel container at the other end thereof separate from said equipment, but connectible to said inlet means, a jacket extending around the body, a heating space defined between the body and the jacket, at least two ducts disposed within the body and spaced apart vertically above the underfeed stoker, said ducts extending through the body and positioned to interconnect different parts of the heating space, means for introducing a fluid to be heated and causing flow thereof through the heating space and through at least one of said ducts, an outlet means from the heating space and through the jacket for the fluid, and an overfire arch situated above the retort and below the ducts for reflecting heat back to the retort.

4,520,741
WASTE DISPOSAL

Richard W. Carbeau, Hingham, Mass.; James F. Martin, Dechard, Tenn.; John H. Lanier, Manchester, Tenn., and William L. Holt, Nashville, Tenn., assignors to ENSCO, Inc., Little Rock, Ark.

Division of Ser. No. 336,251, Dec. 31, 1981, Pat. No. 4,462,318.
This application Apr. 13, 1984, Ser. No. 599,957
Int. Cl.[3] F23G 5/06
U.S. Cl. 110—344 3 Claims



1. The method for reducing liquid and slurry hazardous waste to non-hazardous by-products, comprising: blending the waste with a fuel to obtain a blend of liquid fuel and waste having a predetermined minimum fuel value; feeding said blend to a primary combustor; feeding oxygen-enriched air to said primary combustor in an amount such that a fuel rich-atmosphere is provided in said combustor; imparting a rotational swirl in a first direction to said oxygen-enriched air; mixing and burning said blend together with said oxygen-enriched air to obtain a swirling flame in the primary combustor for a relatively short duration at a high temperature; exhausting the products of combustion from said primary combustor to a secondary combustor; feeding secondary air to said secondary combustor in an amount such that an oxygen-rich atmosphere is provided therein, and imparting rotation to said secondary air when entering said secondary combustor in a direction opposite to the rotational direction of the products of combustion entering the secondary combustor; mixing said products of combustion with said secondary air to reduce the rotational swirl thereof while burning said products of combustion with said secondary air for a substantially long duration at a lower temperature than in the primary combustor; controlling the flow rate at which the waste/fuel blend and the oxygen-enriched air are introduced into the primary combustor and the rate at which the air is introduced into the secondary combustor; and quenching the products exiting from the secondary combustor by spraying water into the products.

4,520,742
SEED PLANTER ATTACHMENT FOR CHISEL PLOW

Steven Anderson, Star Rte., Arlington, Oreg. 97812

Continuation of Ser. No. 522,328, Aug. 11, 1983, abandoned.
This application Sep. 14, 1984, Ser. No. 650,576
Int. Cl.[3] A01C 5/06
U.S. Cl. 111—86 5 Claims

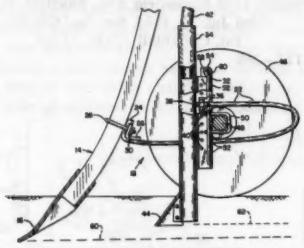
1. A seed planter attached to a vertically oriented chisel plow shank, said seed planter comprising:

(a) a boot;

(b) spring means for mounting said boot in a rearwardly related position from the shank and for imparting a ground engaging bias to said boot;

(c) mounting means for removably and infinitely variably attaching said spring means to said shank at any vertical location along the length thereof so as to adjust the amount of said ground engaging bias;

(d) depth regulating means for regulating the depth of penetration of said boot into the ground independent of the depth the chisel plow penetrates the ground; and

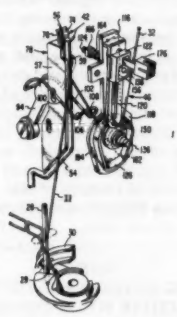


(e) depth adjustment means interconnecting said boot and said depth regulating means for adjusting the depth at which said boot penetrates the ground.

4,520,743
NEEDLE THREAD TENSIONING DEVICE FOR A SEWING MACHINE

Thaddeus J. Zylbert, Morris Plains, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 3, 1984, Ser. No. 637,645
Int. Cl.[3] D05B 47/00, 49/02
U.S. Cl. 112—255 6 Claims



1. In a sewing machine wherein a sewing needle and looptaker cooperate in the formation of lock stitches in a fabric, the combination comprising: a thread source; a thread tensioning device to which thread extends from the thread source, and through which thread may be pulled from the thread source under tension applied by opposing thread engaging members within the device; a thread holder in which thread extending thereto from the thread tensioning device is frictionally engaged between elongate members and from which thread extends to a needle and looptaker; and a takeup for setting stitches and pulling thread through the tensioning device from the thread source, the takeup being movable in a stitch setting direction with thread to one end of its operating range whereat the thread is positioned for temporary retention in the holder, and movable in the opposite direction free of the thread to the other end of said operating range to permit thread to be pulled by the looptaker from the thread holder with movement of the thread from the temporary retention position in the holder to a position of reengagement with the takeup; the thread tensioning device including one or more recesses in the opposing thread engaging members for thread to fall through and so enable the looptaker to obtain thread from said device, without tension applied thereto by the device, in addition to thread obtained from the thread holder.

4,520,744

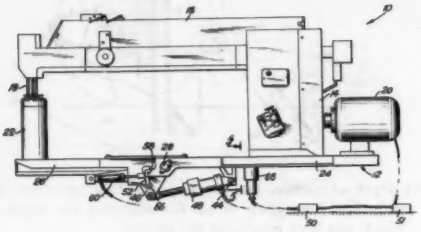
SEWING MACHINE WITH ARTICULATED TABLE ASSEMBLY

Mario Portilla, 1275 Bloomfield Ave., Fairfield, N.J. 07006

Filed Jul. 12, 1984, Ser. No. 629,995

Int. Cl.³ D05B *57/30, 73/04*

U.S. Cl. 112—260 **16 Claims**



1. A sewing machine comprising:

a power means for operating said sewing machine;

an arm member including a needle assembly for performing a sewing operation and a drive means in communication with said needle assembly and said power source for enabling the operation of said needle assembly;

a support structure connected to and supporting said arm member; and

a table including a support portion and an articulated portion, said support portion being securely connected to said support structure and disposed in fixed relationship to said arm, said articulated portion being hingedly connected to said support portion and rotatable relative thereto, said table further including a drive shaft means in communication with said power source, said drive shaft means including a supported portion generally adjacent to the support portion of said table and an articulated portion generally adjacent the articulated portion of said table, said articulated portion of said drive shaft means being hingedly movable with respect to said support portion thereof such that the articulated portions of said table and said drive shaft means can hingedly move with respect to the support portion of said table.

4,520,745

SEAM FORMING METHOD AND DEVICE FOR SEWING MACHINE FOR EMBROIDERY

Hiroaki Shinomiya, and Minetoshi Noguchi, both of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 429,852

Claims priority, application Japan, May 17, 1982, 57-82701

Int. Cl.³ D05C *9/06*

U.S. Cl. 112—266.1 **12 Claims**

1. A method for embroidering a cloth with a pattern having at least a circular arc and an opposite line opposed to the circular arc thereto, said method comprising the steps of:

reading data of at least three points on the circular arc of an original pattern two points of which are end points of the circular arc-shaped line, said data being read in a form of co-ordinates;

determining, in accordance with the thus read data of said three prints, a circular arc orgin and a radius of the circular arc to specify the circular arc;

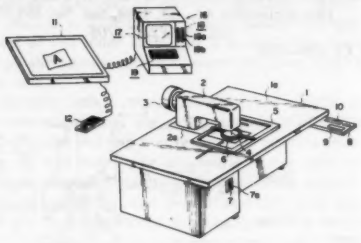
reading data of at least two points on the opposite line of the original pattern;

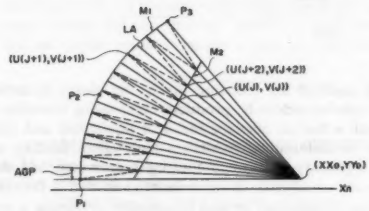
determining, in accordance with predetermined pitch for a needle location point, needle location points on the circular arc specified by said circular arc origin and said radius;

determining a radial bisector passing through said circular arc origin and bisecting an angle defined by radial lines connecting the circular arc origin to two successive needle location points on the specified circular arc;

determining needle location points on the opposite line in such a manner that they are positioned at intersections between said opposite line and said radial bisector; and

moving the cloth or the needle in accordance with said needle location points to embroider the cloth with the pattern.





2. A method according to claim 1, wherein said predetermined pitch for the needle location point is defined by an angular value with respect to the circular arc origin, said needle location points on the circular arc are spaced by twice said angular value and said angle defined by the radial lines corresponds to twice the angular value.

4,520,746

FLOTATION COLLAR

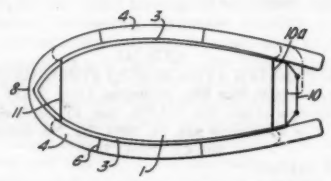
William F. Walters, 103. The Street, Bramford, Ipswich Suffolk, England 1P84DY; Kurt Lammerich, 25 Dalehead Rd., Preston, Lancashire, and John D. Watney, 43 Gertrude St., London SW10, both of England

Filed Dec. 28, 1982, Ser. No. 453,957

Claims priority, application United Kingdom, Jan. 5, 1982, 8200099

Int. Cl.³ B63B *43/10*

U.S. Cl. 114—69 **9 Claims**



1. A method for forming an inflated flotation collar around at least part of the hull of a boat having a radially outwardly extending projection along the gunwale of said hull, said method comprising:

positioning at least one longitudinal inflatable member of a generally tubular construction and made from a substantially inextensible material along at least part of the external length of both the port and starboard sides of said hull and below said radial projection;

securing directly together the terminal portions of said member against movement towards one another so that the

linear length of said gunwale over which said member extends is substantially fixed by securing means separate from said hull and passing around the end surfaces of the stem and stern of the hull but not under said hull; and

inflating said inflatable member, whereby the expansion of said member causes said member to bear against said hull against the restraining effect of the securing of said terminal portions so that said member is held substantially at gunwale level on said hull.

4,520,747

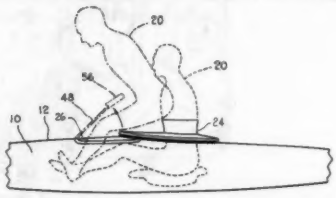
BREAKAWAY KAYAK COCKPIT AND METHOD

William E. Masters, 313 Dogwood La., Easley, S.C. 29640

Filed Feb. 27, 1984, Ser. No. 584,167

Int. Cl.[3] B63B *35/72*

U.S. Cl. 114—347 **19 Claims**



7. In an boat having an enclosed hull with an upper deck and an interior space within said hull, a cockpit opening formed in said deck through which a boater is seated in a cockpit within said interior space, a spray skirt rim around the cockpit opening having an upstanding neck and an outwardly extending lip about which a spray skirt worn by the boater is fitted to cover the cockpit opening for waterproofness, a breakaway cockpit permitting emergency escape from said cockpit comprising:

an egress opening formed in front of said cockpit opening;

a removable egress panel carried in said egress opening forward of said cockpit opening;

a joint defined between edges of said egress opening and said egress panel;

means for sealing said joint to prevent entry of water into said interior space of said hull;

means retaining said egress panel in place within said egress opening in generally flush relation with said deck of said hull;

an interruption formed in said cockpit rim defining an egress space so that the boater may move through said cockpit rim and said egress opening for escape from said cockpit; and

said retention means being overcome by manual force of the boater to dislodge said egress panel from said deck and permit egress from said cockpit of said boat for emergency escape.

4,520,748

DIFFERENTIAL-VACUUM ALARM DEVICE

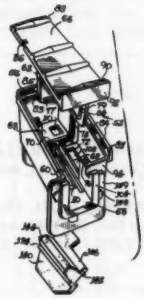
Francis G. Frano, Hoffman Estates, and William E. Ruehl, Wheeling, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 19, 1983, Ser. No. 543,561

Int. Cl.[3] G01L *19/12;* **G08B** *3/00*

U.S. Cl. 116—70 **9 Claims**

1. A device for sounding a tone responsive to a predetermined vacuum differential between a first vacuum source and a second vacuum source, comprising: a housing having a floor and including a snap engageable cover and first and second wall means carried by said housing for forming within said housing three separate internal chambers, said cover being engageable and disengageable from said housing, each one of said three chambers having a chamber floor common with a portion of said housing floor; first and second communication means for respectively bringing a first one and a second one of said three chambers into communication with said first and second vacuum sources; first, second and third aperture means respectively through said first, second and third chamber floors for bringing each respective one of said three chambers into communication with ambient pressure outside of said housing; reed means carried by one of said first and second wall means, said reed means having a through aperture for bringing two of said three chambers which are located on opposite sides of said one of said first and second wall means



into communication, said reed means further having a reed element integral with said reed means and overlying said reed means aperture, for sounding said tone in response to air of predetermined velocity energy flowing in a predetermined direction through said reed means aperture; and valve means carried by said housing, engageable with at least one of said first, second and third aperture means, actuable in response to said predetermined vacuum differential, for causing air to flow in said predetermined direction through said reed means aperture for sounding said tone.

4,520,749

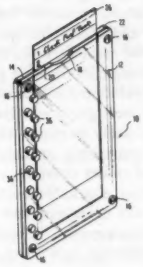
CHECKLIST DEVICE

David A. Jefferson, 353 New Shackle Island Rd., Hendersonville, Tenn. 37075

Filed May 6, 1983, Ser. No. 492,342

Int. Cl.[3] G09F *9/00*

U.S. Cl. 116—325 **3 Claims**



1. A device for indicating that a series of steps have been performed or not performed comprising a container having a pair of planar members disposed in parallel relationship with each other; a shim means positioned between said members and forming a pocket therebetween, each of said members having a peripheral border about said pocket, said border being formed with a plurality of openings to receive indicator buttons; a card having a series of columnar steps imprinted thereon adapted for reception by said pocket, at least one of

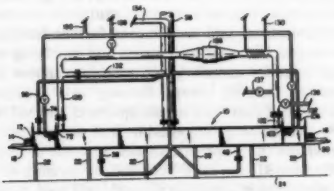
said planar members being transparent in the area over said pocket to expose said steps when said card is in said pocket; and a plurality of manually operated indicator buttons disposed along said border adjacent each of said steps, each of said indicator buttons having a length greater than the thickness of said two members whereby said button, when flush with the exterior of one of said members extends beyond the exterior of the other of said members and each of said indicator buttons having a reduced area formed with protuberances intermediate the ends of said button.

4,520,750

GAS CURING CHAMBER FOR FLAT SUBSTRATES

Maher L. Mansour, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 544,364, Oct. 21, 1983, Pat. No. 4,491,610.
This application Oct. 29, 1984, Ser. No. 665,936
Int. Cl.[3] F26B *15/12, 19/00, 25/00*
U.S. Cl. 118—58 15 Claims



1. A chamber which defines a constant gas flow of passing objects therethrough carried by a conveyor, which comprises an elongate housing having an inlet opening and an outlet opening in the longitudinal direction and a moving conveyor which runs the length of said housing for transporting objects from said inlet opening through said housing and thereout through the outlet opening, the space above said conveyor comprising an inlet zone, a central gas zone, and an outlet zone,

said inlet zone comprising an outer adjustable gate for determining said inlet opening, a central inlet baffle gate, and an inner inlet adjustable deflector wall, the space between said outer gate and said baffle gate being connected to exhaust means, the space between said baffle gate and said deflector wall being a modulating gas cell and containing a gas knife connected to a source of inert gas and capable of injecting said inert gas at an adjustable angle onto said conveyor substantially its entire width;

said outlet zone comprising an outer adjustable gate for determining said outlet opening, a central outlet baffle gate, and an inner adjustable outlet deflector wall, the space between said outer gate and said baffle gate being connected to exhaust means, the space between said baffle gate and said deflector wall being a modulating gas cell and containing a gas knife connected to a source of inert gas and capable of injecting said inert gas at an adjustable angle onto said conveyor substantially its entire width; and

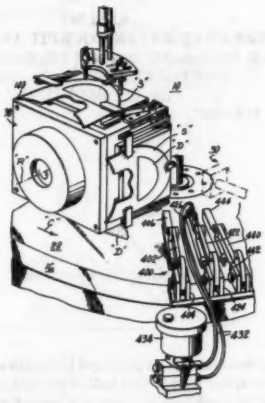
said central gas zone having withdrawal means located in proximity to said inlet deflector wall which withdrawal means are connected to recirculating means for passing gaseous flow back into said central gas zone in a location in proximity to said inner outlet deflector wall, said inlet and outlet deflector walls being sloped downwardly and inwardly within said central gas zone.

4,520,751

RECEIVING BELT MECHANISM

Albert I. Morse; Douglas H. Crowell, both of Beverly, and Thomas J. Gilligan, III, Danvers, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Nov. 30, 1983, Ser. No. 556,451
Int. Cl.[3] B05C *1/02*
U.S. Cl. 118—203 7 Claims



1. A conditioning apparatus for an intermittently rotating annular webbed belt within a frame portion of a powder deposition machine having means thereon for applying a configuration of fusable powder to be heated and cooled and joined with a substrate, comprising:

a residue scraping means arranged over said annular belt;

a fluid applying means arranged over said belt adapted to apply a fluid thereon subsequent to scraping thereof; and

a fluid spreading means arranged over said belt to disperse an even distribution of fluid on said belt from said fluid applying means as said annular belt rotates; said scraping, applying and spreading means each being independently pivotable with respect to said belt for servicing thereof, and each scraping, applying and spreading means each also being independently lockable in an upright orientation to further facilitate servicing of said means or said belt.

4,520,752

DEVICE FOR DEPOSITING A LAYER OF POLYCRYSTALLINE SILICON ON A CARBON TAPE

Christian Belouet, Sceaux, France, assignor to Compagnie General d'Electricite and Societe Nationale Elf Aquitaine, both of Paris, France

Filed Aug. 24, 1984, Ser. No. 643,927
Claims priority, application France, Aug. 30, 1983, 83 13915
Int. Cl.[3] B05C *3/172*
U.S. Cl. 118—405 1 Claim

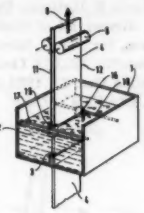
1. Device for depositing a layer of polycrystalline silicon on a carbon tape, comprising:

a crucible adapted to contain a bath of molten silicon,

means for moving vertically upwards a carbon tape at least partially immersed in said bath and passing lengthwise and vertically through an equilibrium surface of said bath, whereby said layer is deposited on said tape,

two vertical channels of semicircular cross-section adapted to be partially immersed in said bath with each one surrounding a respective lateral edge of said tape, whereby

the surface of said bath is raised by capillary action in the vicinity of said lateral edges of said tape, and



supports to which said channels are attached and which are supported by a wall of said crucible.

4,520,753

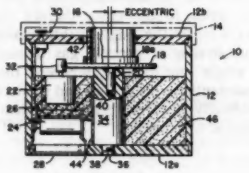
EGG LATHE

Robert E. Breuninger, Lancaster, Pa., assignor to John F. Hinkle, Jr., Columbia and Wendell B. Stockdale, Lancaster, both of, Pa., a part interest

Continuation-in-part of Ser. No. 415,652, Sep. 7, 1982, abandoned. This application Apr. 27, 1984, Ser. No. 605,373

Int. Cl.³ B05C *13/02*

U.S. Cl. 118—500 **15 Claims**



1. An egg lathe for use in coloring eggs, said egg lathe comprising:

(a) a circular egg cup open at the upper end and rotatable about the vertical longitudinal axis of rotation;

(b) a horizontal driven disc coaxially joined to the bottom of said egg cup, said driven disc having a diameter at least as large as the diameter of said egg cup and further having a coaxial depending stem;

(c) a vertically mounted electric motor having a drive shaft engaging the perimeter of said driven disc for rotating said driven disc and said egg cup;

(d) an elongated vertical support means having a downward extending aperture for rotatably receiving the depending stem on said driven disc, said support means being adjustable for controlling the driving friction between said motor and said driven disc; and,

(e) a cellular polymeric block adapted for embedding and supporting in functional relationship therein, said electric motor and said vertical support means.

4,520,754

PROCESS AND APPARATUS FOR ELECTROSTATIC APPLICATION OF LIQUIDS OR POWDERS ON SUBSTANCES OR OBJECTS

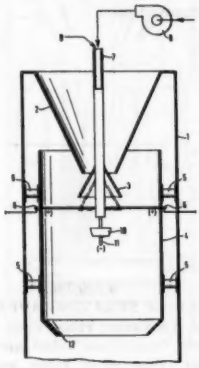
Lester Gange, 25, Bellevue La., Bushey Heath, Hertfordshire, and Reginald J. H. Pannell, 44 Tudor Ave., Worcester Park, Surrey, both of England, assignors to Lester Gange, Bushey Heath; Reginald James Harding Pannell, Worcester Park, both of, England and E.D.T. Electrostatic Deposition Technologies S.p.A., Milan, Italy

Filed Dec. 14, 1982, Ser. No. 449,654

Claims priority, application Italy, Feb. 2, 1982, 19402 A/82

Int. Cl.³ B05B *5/02;* **B05D** *1/04*

U.S. Cl. 118—626 **9 Claims**



3. Apparatus for the electrostatic coating of products with a liquid or powder material comprising a feeding means for introducing the product to be coated, a non-conductive tube comprising a wall surrounding the end of said feeding means, said feeding means having first diffusion means at the end thereof for producing a substantially continuous free-falling circular curtain of the product against the walls of said tube, a high voltage electrode adjacent the wall of said tube for producing a corona discharge zone of a first polarity to charge the product with said first polarity, a central duct extending into said tube for introducing the coating material therein, second centrifugal diffusion means at the end of said duct for diffusing outwardly the coating material, a high voltage electrode adjacent said second diffusion means for producing a corona discharge zone of a second polarity opposite to said first polarity to charge the material with said second polarity, whereby the coating material is electrostatically attracted to the product to coat the product.

4,520,755

SPRAY TYPE COATING APPARATUS

Yuzo Inukai, Shizuoka, and Yoshiaki Shichijo, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 7, 1983, Ser. No. 530,170

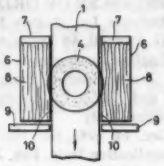
Claims priority, application Japan, Sep. 7, 1982, 57-135660[U]

Int. Cl.³ B05B *15/04*

U.S. Cl. 118—629 **2 Claims**

1. In a spray type coating apparatus of the type in which paint is electrostatically sprayed on a substantially vertically disposed moving web, the improvement comprising a pair of flat substantially vertically disposed boards located adjacent said web on both sides thereof with each of said boards having

a plurality of parallel vertically extending protrusions thereon and a liquid supply unit on the top of said boards for providing



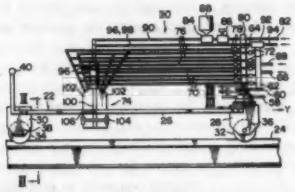
a downwardly flowing uniform film of a cleaning liquid for removing oversprayed paint.

4,520,756

BUILD-UP SPRAYING APPARATUS

Mitsuji Hayashi, Tachikawa; Hideo Endo, Sagamihara; Hirotsugu Oishibashi, Musashino; Takeo Aichi, Kitakyushu, and Shigeru Sasaki, Niiza, all of Japan, assignors to Japanese National Railways, Tokyo and Kyushu Tetsudo Kiki Mfg., Co., Ltd., Fukuoka, both of, Japan

Filed Jun. 20, 1984, Ser. No. 622,716
Claims priority, application Japan, Jul. 20, 1983, 58-130867
Int. Cl.³ B05B *7/16*
U.S. Cl. 118—699 **19 Claims**



1. A build-up spraying apparatus comprising a truck adapted to travel on an article to be subjected to build-up spraying and a build-up spraying burner supported on said truck to carry out build-up spraying with respect to said article, wherein said build-up spraying burner comprises:

a fluid control device for spreading build-up metal powder, said fluid control device being adapted to eject build-up metal powder together with carrier gas toward said article to spread build-up metal powder in the direction perpendicular to the traveling direction of said apparatus;

a device for controlling the supply of control gas so as to alternately supply to said fluid control device two systems of control gas in a pulse-like manner which act to positionally control the spreading rate of build-up metal powder in the spreading direction; and

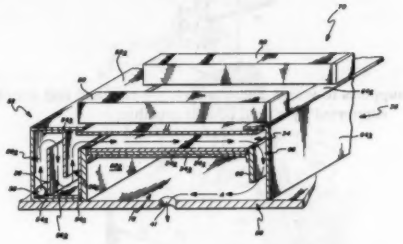
at least one heating burner body for heating build-up metal powder ejected from said fluid control device, said heating burner body being adapted to vary the amount of heat according to the difference in injection rate of build-up metal powder in the spreading direction.

4,520,757

PROCESS GAS INTRODUCTION, CONFINEMENT AND EVACUATION SYSTEM FOR GLOW DISCHARGE DEPOSITION APPARATUS

Prem Nath, Rochester; Kevin R. Hoffman, Sterling Heights, and Timothy D. Laarman, Almont, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 437,075, Oct. 27, 1982, Pat. No. 4,462,333. This application Dec. 23, 1983, Ser. No. 564,863
Int. Cl.³ C23C *11/00*
U.S. Cl. 118—723 **3 Claims**



1. In an isolated glow discharge deposition chamber adapted for the deposition of layers of semiconductor material onto a large area substrate, the chamber including: a cathode spaced from the substrate; means for introducing streams of process gas into the plasma region formed between the cathode and substrate; and means for energizing the cathode to disassociate the process gas into plasma and deposit semiconductor material onto the substrate; the improvement comprising, in combination:

an elongated, apertured manifold adapted to introduce streams of process gas into the deposition chamber, said manifold spaced upstream of and remote from said plasma region;

pattern prevention means operatively disposed upstream of the plasma region, said means cooperatively associated with the manifold so as to (1) introduce only uniform streams of process gas into the deposition chamber, (2) homogenize and interdiffuse all of the adjacent streams of process gas into a single stream prior to the entry thereof into the plasma region; and (3) move the single, substantially uniform and homogeneous stream of process gas through the plasma region at a single rate of flow, whereby the formation of patterns is substantially prevented and semiconductor material of substantially uniform chemical, optical and electrical characteristics is deposited.

4,520,758

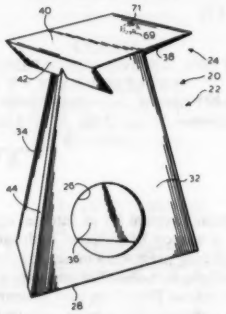
ANIMAL HOUSE

John A. Pfriender, 3 Steuben Dr., Jericho, N.Y. 11753

Filed Feb. 22, 1983, Ser. No. 468,451
Int. Cl.³ A01K *1/03*
U.S. Cl. 119—19 **17 Claims**

1. A combination animal house and perch comprising; an elongated vertical base having an upper end and a lower end formed of a circumferential sidewall arrangement surrounding a hollow interior, a substantially horizontal Platform on the upper end of the base to form an animal perch when the lower end of the base engages a support surface, the sidewall arrangement tapering inwardly from the lower end to the upper end facilitates support of an animal perched on the platform, and an access opening in the sidewall arrangement to permit an animal to enter and leave the hollow interior of the sidewall arrangement thereby forming a house for the animal, the house and platform being formed of a unitary piece of material, a portion of the unitary piece of material used to form the base including three spaced fold lines to form three serially arranged panels and an attached coupling flap whereupon folding of the panels about the fold lines brings the flap into coupling engagement

with a coupling receiving surface on one of the panels in order to shape the base into a three-sided configuration of triangular cross section, the portion of the unitary piece of material used to form the platform including three spaced fold lines to form a serial arrangement of three platform panels, and one of the



fold lines interconnecting the base with one of the platform panels so that when the platform panels are folded about the fold lines a free edge of the platform is brought into engagement with a platform receiving surface on the base so that the platform is positioned as an animal perch.

4,520,759

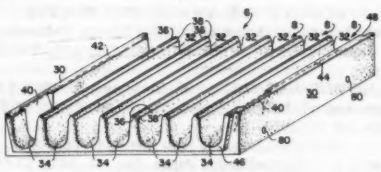
WASTE FLUSHING UNIT FOR HOG FARROWING

Thomas J. Deters, Rte. 1, Box 84, Sigel, Ill. 62462

Filed Jan. 20, 1984, Ser. No. 573,029

Int. Cl.³ A01K *1/01*

U.S. Cl. 119—28 **12 Claims**



1. Apparatus for carrying waste comprising a unitary structure having opposed side walls and a bottom extending between said side walls, at least one interior dividing wall between said side walls forming a plurality of generally parallel channels for carrying said waste, each of said interior dividing wall and said side walls having an upper surface which lies in a common plane, the upper end of said interior dividing wall being chamfered toward said upper surface to support a waste permeable floor and to trap a minimum amount of waste between the end of said interior dividing wall and said floor.

4,520,760

HEAT EXCHANGER OUTLET ARRANGEMENT

Russell B. Covell, Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 23, 1984, Ser. No. 602,857

Int. Cl.³ F22D *1/00*; C10J *3/48*

U.S. Cl. 122—7 R **14 Claims**

1. A fluid cooled heat exchanger for cooling product gas comprising:

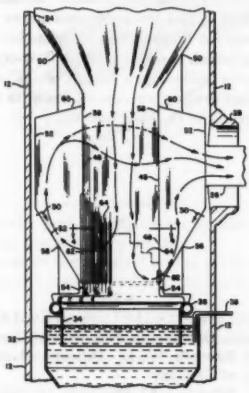
a gas tight water wall, having a gas inlet at the top for receiving hot product gas with entrained solids and a gas outlet near the bottom for discharging cooled product gas, for radiant heat exchange from the product gas to fluid passing through the water wall;

an inward taper in the water wall near the bottom of the water wall;

a first portion of the tapered water wall forming an inner gas tight heat exchange surface enclosing a passage for conducting the product gas beyond the inward taper;

a second portion of the water wall forming an outer gas tight heat exchange surface surrounding the inner gas tight heat exchange surface and defining an annular passage therebetween, the annular passage in fluid communication with the gas outlet; and

a plurality of openings in the inner gas tight heat exchange



surface for passing the product gas from within the inner gas tight heat exchange surface to the annular space between the inner and outer heat exchange surfaces, said openings over a range of sizes with the largest opening most distant from the gas outlet and the smallest opening nearest the gas outlet and with openings of graduated area therebetween whereby the path of least resistance to the product gas flow from within the inner gas tight heat exchanger surface to the annular space between the inner and outer heat exchange surfaces is most distant from the gas outlet and the path of most resistance is nearest the gas outlet.

4,520,761

DIRECT CONTACT WATER HEATER

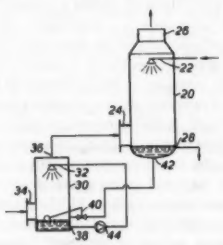
Gerald D. Arnold, Huddersfield, England, assignor to John Thurley Limited, Harogate, England

Filed May 20, 1983, Ser. No. 496,508

Claims priority, application United Kingdom, May 20, 1982, 8214681

Int. Cl.³ F22B *1/02*

U.S. Cl. 122—31 R **6 Claims**



1. A direct contact water heater comprising: a main chamber

including a hot gas inlet and cold water feed means to feed cold water in said main chamber, whereby to effect direct contact heat exchange between said hot gas and said cold water, the improvement wherein said heater also includes an antechamber having a hot gas outlet coupled to said inlet of said main chamber, and including means to input hot gas into said antechamber and hot water feed means to feed hot water into said antechamber, the temperature of said hot water being higher than the dew point of the hot gas input into the antechamber whereby the dew point of the hot gas outputted by the antechamber is increased and whereby the cold water is heated to a temperature higher than the dew point of the hot gas fed into the antechamber, said antechamber including a hot water outlet coupled to said hot water feed means whereby said hot water is recycled through said antechamber, and a reservoir, the level of which is maintained by flow-control means, said main chamber including a heated water outlet, said outlet being coupled to said flow-control means to maintain the level in said reservoir in the antechamber.

4,520,762

FORCED THROUGH-FLOW STEAM GENERATOR

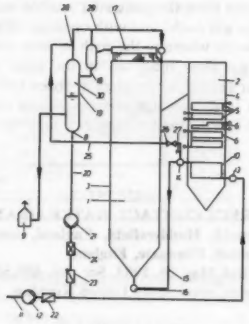
Heino Martin, Oberhausen, Fed. Rep. of Germany, assignor to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,233

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3236979

Int. Cl.³ F22D *7/00*

U.S. Cl. 122—406 ST **5 Claims**



1. Forced flow-through steam generator comprising: feed water pump, economizer, evaporator, and water separator having a vapor space above its water level connected in series; a circulation pipe connected to a water outlet of said water separator; said economizer being located at a level higher than an inlet of said evaporator; evaporation pipe means with valve means, exit means of said economizer being connected by said evaporation pipe means to the highest point of said evaporator, during filling the steam generator with water, water pressing steam bubbles into said vapor space above the water level by said evaporation pipe means to fill the steam generator with a substantially small quantity of feed charging water without vapor remaining in said economizer for preventing pressure reduction in the steam generator occurring when charging with a substantially large quantity of water.

4,520,763

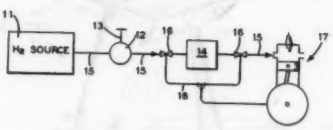
FUEL INJECTION SYSTEM

Franklin E. Lynch, Conifer, and Nathaniel R. Baker, Denver, both of Colo., assignors to Ergenics Inc., Wyckoff, N.J.

Continuation of Ser. No. 305,409, Sep. 25, 1981, abandoned. This application Jun. 6, 1984, Ser. No. 617,713

Int. Cl.³ F02D *21/02*

U.S. Cl. 123—1 A **22 Claims**



1. A fuel injection system for an internal combustion engine coupleable to a source of gaseous hydrogen comprising a means for controlling pressure, a means to selectively vary said pressure control means, a chamber into which hydrogen gas of regulated pressure can flow from said pressure control means, conduit means between said pressure control means and said chamber and a combustion volume of said internal combustion engine and means, timed to said internal combustion engine, whereby during a fuel intake event of said combustion volume of said engine flow of hydrogen from said chamber to a combustion volume of said engine is permitted and from said pressure control means to said chamber is prohibited and whereby the absence of a fuel intake event of said combustion volume of said engine, flow of hydrogen is permitted from said pressure control means to said chamber and prohibited from said chamber to said combustion volume of said internal combustion engine.

4,520,764

STARTER FOR AN ALCOHOL ENGINE

Masuo Ozawa, Yokohama, and Toshio Hirota, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

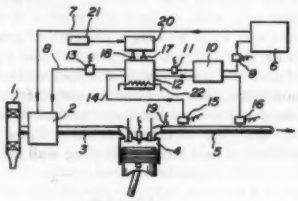
PCT No. PCT/JP79/00329, § 371 Date Aug. 28, 1980, § 102(e) Date Aug. 27, 1980, PCT Pub. No. WO80/01398, PCT Pub. Date Jul. 10, 1980

PCT Filed Dec. 27, 1979, Ser. No. 205,448

Claims priority, application Japan, Dec. 28, 1978, 53-161047

Int. Cl.³ F02M *27/02, 31/08*

U.S. Cl. 123—3 **8 Claims**



1. In combination, an alcohol engine which operates exclusively on alcohol fuel, a source of alcohol fuel connected to said engine, and a starter for said engine, said starter comprising:

means connected to said fuel source for receiving alcohol fuel from said fuel source and reforming a portion of said alcohol fuel during operation of said engine into gaseous fuel containing hydrogen and carbon monoxide as its main components, comprising reforming means for producing said gaseous fuel, and storage means for storing said gaseous fuel, and wherein said reforming means is positioned

to receive heat from an exhaust pipe, and said storage means is located in a position remote from said engine and said exhaust pipe so as not to be affected by heat from said engine or said exhaust pipe; and

means for supplying said gaseous fuel to said engine from said storage means only during starting periods of said engine.

4,520,765

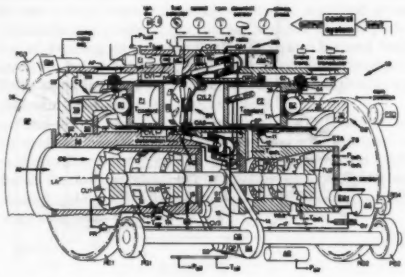
INTERNAL COMBUSTION ENGINE AND OPERATING CYCLE THEREFOR

Anthony Gerace, 28 Allegheny Ave., #2601, Towson, Md. 21204

Filed Apr. 28, 1983, Ser. No. 489,549

Int. Cl.³ F02G *1/044*

U.S. Cl. 123—27 R **20 Claims**



1. A method for extracting work from a fuel comprising the steps of:

forming a homogeneous mixture of a combustion supporting gas and a fuel;

compressing the homogeneous mixture of a combustion supporting gas and a fuel to a predetermined pressure less than that which would effect ignition;

compressing a quantity of combustion supporting gas to a predetermined pressure sufficient to cause the temperature of the so-compressed compression supporting gas to increase to a temperature greater than that of the ignition temperature of said so-compressed homogeneous mixture of a combustion supporting gas and a fuel;

introducing the so-compressed combustion supporting gas into the so-compressed mixture of a combustion supporting gas and fuel to cause ignition thereof and the formation of combustion products;

introducing the combustion products of the so-ignited mixture of the combustion supporting gas and fuel into the compressed combustion supporting gas to cause the addition of heat thereto; and

extracting work from the combustion products of said so-ignited mixture and the additionally heated combustion supporting gas.

4,520,766

DUAL FUEL VALVE

Richard T. Akeroyd, 3803 67th St., Lubbock, Tex. 79403

Continuation-in-part of Ser. No. 378,100, May 14, 1982, Pat. No. 4,463,734. This application Jun. 4, 1984, Ser. No. 616,855

Int. Cl.³ F02B *49/00*; F02M *21/02*

U.S. Cl. 123—27 GE **6 Claims**

1. On a diesel engine

a. having an inlet air conduit,

b. a governor on the engine,

c. an output rod from the governor,

d. said output rod controlling liquid injectors on the engine, wherein the improvement comprises in combination:

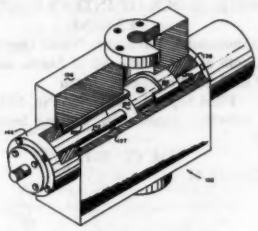
e. a gas metering valve including a cylinder,

f. a plug in the cylinder, said plug connected to the output rod, so that

g. means connected to said plug for moving said plug axially in the cylinder responsive to the movement of the output rod of the governor,

h. an inlet cylinder port into said cylinder,

i. said inlet port entirely closed by said plug when the load of the engine is very small as reflected by the position of the governor output rod,



j. an outlet cylinder port entirely closed by said plug when the load of the engine is very small,

l. said inlet and outlet ports shaped so that gas flow through the metering valve is proportional to the movement of the plug,

m. said inlet port connected to a source of gas fuel, and

n. the outlet port connected to the air inlet conduit.

4,520,767

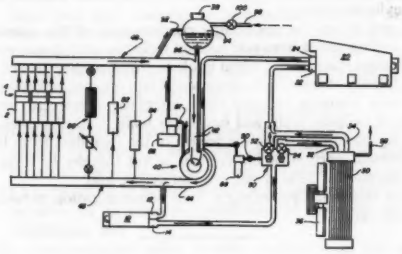
LOW FLOW COOLING SYSTEM AND APPARATUS

Leslie A. Roettgen; Beth A. Webber; Robert M. Brooks, and Robert J. Layman, all of Columbus, Ind., assignors to Cummins Engine Company, Columbus, Ind.

Filed Sep. 16, 1983, Ser. No. 533,099

Int. Cl.³ F01P *3/12, 7/16*

U.S. Cl. 123—41.1 **14 Claims**



1. A cooling system for an internal combustion engine having an oil cooler, said system operative in various modes and comprising a combination of a heat exchanger and a heat exchanger bypass passage in parallel connection, said combination being downstream of the oil cooler and serially connected to a discharge end of the oil cooler, pumping means for circulating a heat exchange medium through said cooling system and the oil cooler whereby the temperature potential across the heat exchanger is increased, thereby permitting a reduction in the size of the heat exchanger, and control means for sensing the temperature of the heat exchange medium at at least one predetermined location in the cooling system and in response to the temperature sensed, effecting flow of substantially all of the medium discharged from the oil cooler through only the combination heat exchanger when the cooling system is in a full cooling mode; effecting flow of substantially all of the

medium discharged from the oil cooler through only combination bypass passage when the cooling system is in a full heating mode; and effecting predetermined proportioning of substantially all of the medium discharged from the oil cooler between the heat exchanger and the bypass passage of said combination when said cooling system is operating in a mode intermediate the full cooling and full heating modes.

4,520,768

CYLINDER BLOCK OF INTERNAL COMBUSTION ENGINE

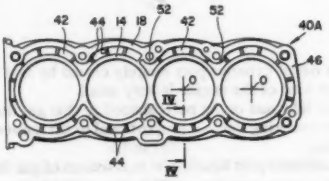
Hitoshi Shimonosono, Yokosuka; Naoki Ogawa, and Yoshinori Hirano, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 11, 1984, Ser. No. 649,505

Claims priority, application Japan, Sep. 13, 1983, 58-140864[U]

Int. Cl.³ F01P *3/02*

U.S. Cl. 123—41.44 **6 Claims**



1. In an internal combustion engine including a structure defining aligned cylinders,

walls of said cylinders which are integrally connected at their peripheral portions;

outer walls which surround said cylinder walls to form therebetween a coolant jacket into which the coolant is introduced in a liquid state and from which the coolant is discharged in a gaseous state;

first means for maintaining the level of the liquid coolant in the coolant jacket at such a level as to entirely cover the cylinder walls;

second means for controlling condensation of the gaseous coolant issued from said coolant jacket in accordance with temperature of the liquid coolant in the coolant jacket;

a plurality of spaced ribs disposed in said coolant jacket with their laterally opposed sides integrally connected with said cylinder walls and said outer walls, said ribs extending essentially along the length of the cylinders from the bottom portion of the coolant jacket thereby to form a plurality of cells in said coolant jacket; and

third means for providing a fluid communication between the cells.

4,520,769

ENGINE HEATING SYSTEM

John D. Kratzer, 125 Stearman, Erie, Colo. 80516

Filed Jul. 30, 1984, Ser. No. 635,405

Int. Cl.³ F02N *17/02*

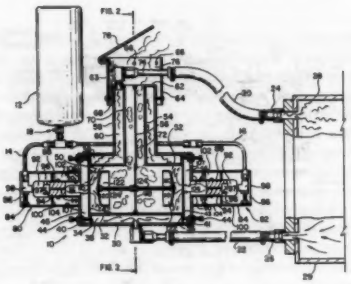
U.S. Cl. 123—142.5 R **8 Claims**

1. A heating system for heating a fluid by use of a supply gas comprising:

an elongated heater tube means having a central longitudinal axis mounted in a horizontal attitude including concentrically mounted horizontally extending outer tube means and inner tube means divided by central plate means and closed by end plate means for providing a pair of oppositely disposed combustion chambers and an outermost fluid chamber surrounding said combustion chambers;

an elongated stack tube means having a central longitudinal axis centrally mounted on said elongated heater tube means in a vertical attitude including concentrically mounted vertically extending outer tube means connected to said horizontally extending outer tube means and vertically extending inner tube means connected to said horizontally extending inner tube means with an end plate means mounted therebetween for providing a vertically extending fluid chamber connected to said horizontally extending fluid chamber in circumjacent relationship to a vertically extending exhaust chamber connected to each of said pair of oppositely disposed combustion chambers;

a pair of oppositely disposed gas burner means mounted on opposite ends of said elongated tubular heater means for simultaneously supplying a combustible air-gas mixture to and simultaneously burning a combustible air-gas mixture in each of said oppositely disposed combustion chambers;



low temperature fluid inlet means for connecting said outermost horizontally extending fluid chamber means to a relatively low temperature body of fluid in a fluid storage means and for continuously supplying and filling said outermost horizontally and vertically extending fluid chamber means with fluid during operation of the heating system; and

high temperature fluid outlet means for connecting said vertically extending fluid chamber means to the fluid storage means and creating a flow of fluid into said horizontal fluid chamber means and laterally around each of said oppositely disposed combustion chambers and then upwardly through said vertically extending fluid chamber means whereby the fluid is first heated in said horizontal fluid chamber means and subsequently further heated in said vertical fluid chamber means.

4,520,770

AUTOMOTIVE INTERNAL COMBUSTION ENGINE WITH BEARING BEAM STRUCTURE

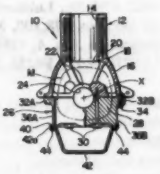
Naoki Ogawa, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 29, 1982, Ser. No. 428,268

Claims priority, application Japan, Oct. 7, 1981, 56-148918[U]

Int. Cl.³ F02F *7/00*

U.S. Cl. 123—195 H **8 Claims**



1. An automotive internal combustion engine comprising:

a cylinder block having a bottom portion including a plurality of bearing sections; and

a bearing beam structure secured to the bottom portion, said bearing beam structure including:

a plurality of main bearing cap sections each of said bearing cap sections being aligned with a respective one of said plurality of bearing sections to form therewith a plurality of axially aligned bores for rotatably supporting a journal of a crankshaft, each of said bearing cap sections including opposed substantially vertical side portions defining a surface area;

first and second side walls respectively connected respectively with substantially the entire surface area of said opposing side portions of said plurality of bearing cap sections to securely connect said bearing cap sections with each other, said first and second side walls extending generally parallel to an axis of said axially aligned bores;

first and second beam sections respectively attached to and connecting opposite upper corner portions of said plurality of bearing cap sections, said first and second beam sections being integral with and projecting outwardly from said first and second side walls, respectively, and extending parallel with said axis; and

third and fourth beam sections respectively attached to and securely connecting opposite lower corner portions of said plurality of bearing cap sections, said third and fourth beam sections projecting outwardly from said first and second side walls, respectively, and extending parallel with said axis.

4,520,771

INTERNAL COMBUSTION ENGINE

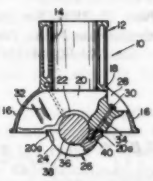
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 21, 1983, Ser. No. 544,206

Claims priority, application Japan, Oct. 26, 1982, 57-162235[U]

Int. Cl.³ F02F *7/00*

U.S. Cl. 123—195 H **10 Claims**



1. An internal combustion engine comprising:

a cylinder block including a plurality of integral main bearing bulkheads, and an integral skirt section;

means defining first and second through-holes formed in each bearing bulkhead, each through-hole having a first end opened to said skirt section, and a second end opened to a bottom surface of said bearing bulkhead, an axis of each through-hole being inclined relative to a vertical plane containing an axis of a crankshaft;

means defining a depression at the bottom surface of said bearing bulkhead;

a plurality of bearing caps each of which fits in said depression and is generally semicylindrical, each bearing cap being formed with first and second threaded holes which are aligned with said first and second through-holes, respectively, an axis of each threaded hole being inclined relative to said vertical plane and extending straight and substantially along the curvature of said bearing cap; and

first and second bolts disposed respectively in said first and second through-holes, each bolt having a first end section located in said through-hole of said skirt section, and a second end section which is threaded and screwed in a respective one of said first and second threaded holes of said bearing cap, each bolt being dimensioned to extend through its respective through-hole and terminate in its respective threaded hole.

4,520,772

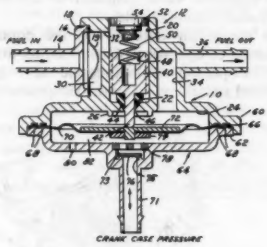
FUEL SHUT-OFF VALVE FOR INTERNAL COMBUSTION ENGINES

William A. Scott, Cass City, and Roger N. Smith, Caro, both of Mich., assignors to Walbro Corporation, Cass City, Mich.

Filed Mar. 2, 1984, Ser. No. 585,494

Int. Cl.³ F02B *77/08*

U.S. Cl. 123—198 DB **1 Claim**



1. An automatic fuel shut-off valve for use in a fuel line below a fuel tank in a fuel supply system for an internal combustion engine which comprises:

(a) a housing shell having a fuel inlet passage and a fuel outlet passage in line on a coincident first axis, an inlet chamber and an outlet chamber in said housing on opposite sides of a central axis normal to said first axis, each communicating respectively with the said inlet and outlet passages, a central cylinder formed between said chambers on said central axis open at one end to said inlet chamber and having a valve seat at the other end open to said outlet chamber,

(b) a slide valve in said cylinder having an open and closed position and shaped to allow flow around its periphery from said inlet chamber to said outlet chamber, and a valve end formed on said slide valve to close said seat in the closed position of said valve, said slide valve having a projection extending below said seat into a diaphragm chamber formed in said housing,

(c) means to bias said valve to a closed position,

(d) a diaphragm in said diaphragm chamber positioned to act on said projection to open said valve against said biasing means to allow fuel to flow from said inlet to said outlet,

(e) a connection in said housing for introducing crankcase pressure of an internal combustion to one side of said diaphragm, and

(f) a unidirectional valve in said connection so that only positive pressure pulses reach said diaphragm to open said valve when an engine is running.

4,520,773

FUEL INJECTION CLEANING AND TESTING SYSTEM AND APPARATUS

James R. Koslow, Westland, Mich., assignor to Miller Special Tools Division Triangle Corporation, Stamford, Conn.

Continuation of Ser. No. 358,519, Mar. 18, 1982, abandoned. This application Sep. 13, 1984, Ser. No. 650,345

Int. Cl.³ B08B *3/08;* F02B *77/04*

U.S. Cl. 123—198 A **24 Claims**

1. An apparatus for cleaning and testing the fuel injection valve system of a vehicle engine, said valve system including at least one electronically pulsed fuel injection valve operably secured to and associated with said engine, means for supplying fuel to said at least one valve, means for controlling said at

least one electronically pulsed valve to feed fuel to said engine, and means for powering said controlling means, said apparatus comprising:

means for feeding a liquid into said fuel supplying means of said vehicle engine, comprising:

an outlet conduit,

means for storing a supply of said liquid,

means separate from said fuel supplying means for pumping said liquid from said storing means to said outlet conduit, and

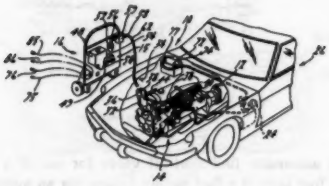
means for communicating said storing means with said pumping means;

means for controlling said liquid feeding means, comprising:

means for operating said at least one electronically pulsed fuel injection valve disposed in operable association with said vehicle engine,

switch means for determining the commencement or cessation of operation of said feeding means, and

means for operably associating said valve operating means and said switch means with said powering means;



means for operably associating said outlet conduit of said feeding means with said valve fuel supplying means and disabling said valve fuel supplying means to permit said feeding means to be the source of the fuel supply for said at least one fuel injection valve;

means for measuring the flow through one fuel injection valve at a remote location during operation of the injection valve while the injection valve is operably secured to and associated with said engine, said measuring means being integrated with said fuel supplying means;

a device for transporting said control, said communicating means, said pumping means, said storage tank, said outlet conduit and said measuring means to and from operable association with said engine; and

valve means disposed on said transporting device for actuating said measuring means when said valve means is disposed in a first position and for bypassing said measuring means when said valve means is disposed in a second position, said measuring means being readily removable from operable association with said valve system by operably disassociating said outlet conduit operably associating means from said feeding means.

4,520,774

FUEL INJECTION APPARATUS WITH PILOT INJECTION AND MAIN INJECTION IN INTERNAL COMBUSTION ENGINES

Erhard Sitter, Horb, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

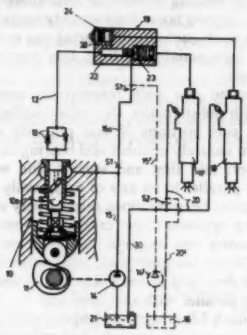
Filed Aug. 24, 1984, Ser. No. 644,071

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330774

Int. Cl.³ F02M *45/02, 59/38*

U.S. Cl. 123—300 **15 Claims**

1. A fuel injection apparatus with pilot injection and main injection in internal combustion engines, in particular Diesel engines, having a main injection nozzle supplied with a main injection quantity by a high-pressure injection pump and a hydraulic pilot-injection auxiliary pump driven by the supply pressure of the high-pressure injection pump, said auxiliary pump arranged to contain a pilot injection piston and a work chamber disposed in proximity thereto and from which the pilot injection quantity is positively displaced to a pilot injection nozzle, means for adjusting the useful stroke of the pilot injection piston and for prespecifying the pilot injection quantity (Q_{VE}), the combination comprising, a storage piston provided independently of said pilot injection piston and mechanically separate therefrom for the determination of said pre-



specifiable injection interval between said pilot injection and said main injection, said pilot injection piston being disposed such that while avoiding an initial pressure division, the supply pressure generated by said high-pressure injection pump acts solely upon the pilot injection piston and subsequently, as a result of the stroke movement of said piston, uncovers a pressure conduit which leads to the storage piston.

4,520,775

INTAKE SYSTEM FOR MULTIPLE VALVE TYPE ENGINE

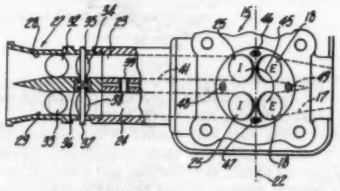
Haruo Nakamura, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Nov. 19, 1981, Ser. No. 322,768

Claims priority, application Japan, Nov. 20, 1980, 55-163988

Int. Cl.³ F02M *35/10*

U.S. Cl. 123—308 **11 Claims**

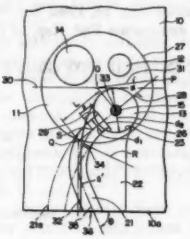


1. In an induction system for an internal combustion engine of the type having a pair of intake ports for providing a charge to a common chamber of the engine, separate intake passages each independently serving a respective one of said intake ports, throttle valve means in said intake passages for controlling the flow therethrough so that an idle charge is delivered to the chamber primarily through a first of said intake passages and wide open load charge requirements are supplied through both of said induction passages, the improvement comprising an interconnecting passage extending between said first intake passage and the second intake passage downstream of said throttle valve means for providing communication between said passages regardless of the position of said throttle valve means.

4,520,776
INTAKE PORT STRUCTURE FOR INTERNAL COMBUSTION ENGINES

Tokuzi Ishida, Hamamatsu, and Kiyotaka Aono, Toyooka, both of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Kami, Japan

Continuation of Ser. No. 430,063, Sep. 30, 1982, abandoned. This application Apr. 4, 1984, Ser. No. 596,563
Claims priority, application Japan, Feb. 8, 1982, 57-17420
Int. Cl.³ F02B *31/00*
U.S. Cl. 123—308 **1 Claim**



1. An intake port structure for an internal combustion engine having a plurality of cylinders, comprising:

(a) a cylinder head including combustion chambers each having a longitudinal central axis and supporting an intake valve and an ignition plug in each of said combustion chambers, said intake valve having a stem slidably supported by said cylinder head, said cylinder head having a joint surface;

(b) a primary intake passage defined in said cylinder head and communicating with each of said combustion chambers, said primary intake passage having one end defining a primary intake port directed toward said stem and said ignition plug, said primary intake passage at the other end terminating in an opening at said joint surface;

(c) a secondary intake passage defined in said cylinder head and communicating with each of said combustion chambers, said secondary intake passage having a secondary intake port opening into said combustion chamber, and said primary intake port opening into said secondary intake passage;

(d) a two-barrel carburetor having a primary intake passageway for supplying air-fuel mixture to the combustion chambers under a full range of loads and a secondary intake passageway for supplying an air-fuel mixture to the combustion chambers under higher loads, and an intake manifold connected to said joint surface of said cylinder head and to said carburetor, said intake manifold having a plurality of primary branches each of which provides communication from the primary intake passageway to a respective said primary intake passage, said primary branches being arranged symmetrically with respect to a central axis of the intake manifold, said intake manifold also having a plurality of secondary branches each of which provides communication from said secondary intake passageway to a respective said secondary intake passage;

(e) said primary intake passage having a first straight end portion leading to said primary intake port and having a length which is greater than the diameter of said primary intake port, said first straight end portion having a first longitudinal center line which when extended outwardly beyond the primary intake port first intersects the stem of the intake valve and then intersects the periphery of the combustion chamber at a point thereon, said point being connected to the longitudinal center axis of said combustion chamber by a straight line which extends at an angle ranging from 20° to 30° with respect to said first center line when viewed in a plane which extends perpendicular to the longitudinal central axis of said cylinder;

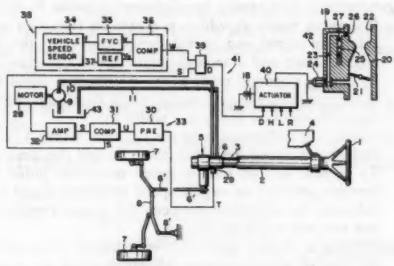
(f) said primary intake passage including a second straight end portion which terminates in said opening at said joint surface, and a smoothly curved arcuate central portion which connects said first and second straight end portions, said arcuate central portion having an arcuate central axis which tangentially contacts said first center line and at a location spaced therefrom also tangentially contacts an imagery straight working line which extends perpendicularly with respect to said joint surface and intersects said first center line at a working point which is adjacent but spaced outwardly from the periphery of said cylinder, said working point being spaced from the longitudinal axis of the intake valve stem by a distance which is greater than the diameter of the secondary intake port, and said arcuate central portion continuing to smoothly curve outwardly beyond its tangential contact with said working line for connection with said second straight end portion;

(g) said second straight end portion having a second longitudinal center line which tangentially contacts said arcuate central axis and which intersectingly extends at an angle of less than 90° with respect to said joint surface when viewed in said plane which is perpendicular to said longitudinal central axis.

4,520,777
SYSTEM FOR STABILIZING IDLING OF VEHICULAR ENGINE

Yukiyoshi Hatori; Eiji Yagi, and Yuji Kobari, all of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 30, 1982, Ser. No. 445,558
Claims priority, application Japan, Dec. 15, 1981, 56-202316
Int. Cl.³ F02M *3/00*
U.S. Cl. 123—339 **6 Claims**



3. A system for stabilizing idling operation of a vehicular engine, comprising:

a power steering system comprising a hydraulic power unit for providing power assistance to the steering system of the vehicle, a hydraulic fluid pump for supplying a hydraulic fluid under pressure to the power unit, sensing means for sensing at least one variable indicating steering conditions of the vehicle, and controlling means connected with the sensing means for generating a driving signal to control the fluid pump in an on/off control mode in accordance with the variable sensed by the sensing means,

low speed detecting means for generating a low speed signal when a vehicle speed is below a predetermined speed,

judging means, connected with said controlling means of said power steering system and said low speed detecting means, for generating an actuating signal when both of said driving signal and said low speed signal are present, and

engine rotational speed adjusting means, connected with said judging means, for increasing the supply of an air fuel

mixture to the engine by a predetermined amount when said actuating signal is generated by said judging means.

4,520,778

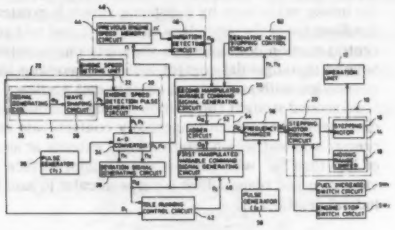
METHOD OF CONTROLLING ENGINE SPEED FOR INTERNAL COMBUSTION ENGINE

Hirotoshi Nanjo, Mishima; Hiroo Satou, Susono, and Osamu Takahashi, Numazu, all of Japan, assignors to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Oct. 11, 1983, Ser. No. 540,368

Int. Cl.³ F02D *11/10*

U.S. Cl. 123—352 10 Claims



1. A method of controlling an engine speed for an internal combustion engine by controlling an engine speed adjusting operation unit which controls to keep the engine speed of the internal combustion engine at a set engine speed based on proportional control and derivative control action, comprising the steps of:

generating a reference signal P_0 of a reference signal width θ_0 at a predetermined rotational angle position of the engine;

generating a first engine speed detection pulse P_1 having a first pulse width θ_1 which is narrower than that of said reference signal and varied depending upon the actual engine speed and a second engine speed detection pulse P_2 having a second pulse width θ_2 which is equal to the difference between said signal width θ_0 of said reference signal P_0 and said first pulse width θ_1;

obtaining the difference between the time width T_1 of said first engine speed detection pulse P_1 and the time width T_2 of said second engine speed detection pulse P_2 to thereby generate an engine speed deviation signal which indicates the deviation between the actual engine speed and said set engine speed;

generating an engine speed derivative signal which indicates the rate of change of said deviation signal or an actual engine speed signal obtained on the basis of said time width T_1 of said first engine speed detection pulse P_1 with respect to time;

deteriming the range between an engine speed at which said first pulse width θ_1 is rendered zero and an engine speed at which said second pulse width θ_2 is rendered zero to be a derivative control engine speed range;

generating a first manipulated variable command signal which determines a manipulated variable of an engine speed adjusting operation unit of said internal combustion engine depending upon said engine speed deviation signal;

generating a second manipulated variable command signal which determines a manipulated variable of said engine speed adjusting operation unit depending upon said engine speed derivative signal; and

operating said engine speed adjusting operation unit based upon said first manipulated variable command signal to allow only the proportional control action to be carried out when said actual engine speed of the engine is out of said derivative control engine speed range, and operating said engine speed adjusting operation unit based upon both of said first and second manipulated variable command signals to allow the proportional control action and derivative control action to be carried out when said actual engine speed is within derivative control engine speed range.

4,520,779

REGULATING DEVICE FOR THE SIGNAL OF AN ELECTROMAGNETIC CONTROL ELEMENT

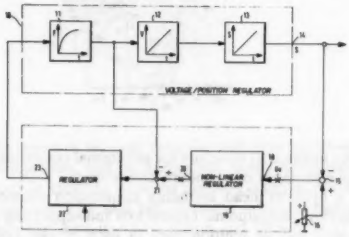
Hans Kubach, Korntal-Münchingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 320,998, Nov. 13, 1981, abandoned. This application Jan. 16, 1984, Ser. No. 570,442

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3042917

Int. Cl.³ F02D *5/00*; G05D *3/00*

U.S. Cl. 123—357 8 Claims



1. A regulating device for controlling the position of an electromagnetic control element according to a set point value, comprising a sensor for sensing an actual position value and at least one regulating loop circuit including a set-point/actual-value comparison means and a regulator having at least one of a control characteristic P, I and D, and said at least one characteristic being responsive to at least one of an output signal from and an input signal to said regulator.

4,520,780

DIESEL FUEL INJECTION PUMP WITH FUEL INJECTION CUTOFF UPON DETECTION OF EXCESSIVE ACTUAL FUEL COMBUSTION TIME

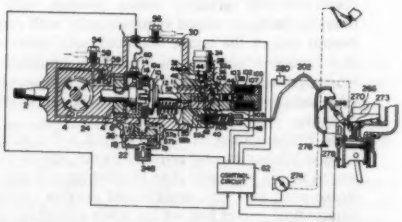
Yoshiyasu Ito; Fumiaki Kobayashi, and Hideo Miyagi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 13, 1984, Ser. No. 650,246

Claims priority, application Japan, Dec. 22, 1983, 58-242969; Jan. 23, 1984, 59-9755

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—359 7 Claims



1. For a diesel engine comprising cylinders and a crankshaft: a fuel injection pump, comprising:

(a) an input shaft which is rotated in a predetermined phase relationship with said crankshaft;

(b) a housing and a plunger which slides in a bore formed in

said housing and is coaxial with said input shaft, a high pressure chamber being defined at an end of said plunger between it and said bore, and another end of said plunger being rotationally engaged with said input shaft but being free to move axially with respect thereto;

(c) a means for communicating said high pressure chamber to inject fuel into one or another cylinder of said diesel engine, according to the rotational position of said plunger, substantially only when said plunger is axially moving so as to reduce the size of said high pressure chamber;

(d) an electrically actuated electromagnetic valve, comprising a solenoid coil, which selectively vents said high pressure chamber;

(e) a means for selectively actuating and deactuating said electromagnetic valve, so as to provide fuel injection in appropriate amount to said diesel engine;

(f) a means for determining whether or not the voltage across said solenoid coil of said electromagnetic valve, when said means for selectively actuating and deactuating said electromagnetic valve deactuates said electromagnetic valve from its actuated condition, rises higher than a certain value, or not;

(g) a means for restraining said diesel engine; and

(h) a means for actuating said means for restraining said diesel engine if said determining means detects that said voltage across said solenoid coil of said electromagnetic valve when it is deenergized from the energized condition has not risen to higher than said certain value.

4,520,781

IGNITION CONTROL SYSTEM OF INTERNAL COMBUSTION ENGINE

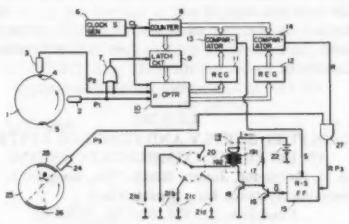
Minoru Nishida, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1982, Ser. No. 414,955

Claims priority, application Japan, Sep. 16, 1981, 56-147533; Sep. 16, 1981, 56-147534; Sep. 16, 1981, 56-147535

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—414 **8 Claims**



1. An ignition control system of an internal combusion engine comprising:

a spark plug mounted to a cylinder of an internal combustion engine, said cylinder slidably receiving a piston coupled to a crank shaft,

spark plug driving means coupled to said spark plug and responsive to an externally applied ignition enabling signal for electrically driving said spark plug for causing ignition

rotational angle position signal generating means operatively coupled to said crank shaft for generating a rotational angle position signal representing the position of said piston of said internal combustion engine determinable in terms of the rotational angle position of said crank shaft,

ignition enabling signal generating means coupled to said rotational angle position signal generating means and responsive to said rotational angle position signal for generating said ignition enabling signal at an ignition timing associated with the rotational speed of said internal combustion engine, and

ignition enabling means for determining an allowable ignition timing range for said internal combustion engine in terms of an allowable rotational angle range of said crank shaft for enabling application of said ignition enabling signal to said spark plug driving means only during said allowable rotational angle range

said ignition enabling means comprising

a rotating member coupled to said crank shaft,

rotational angle range determining means for determining said allowable rotational angle range of said rotating member for generating an allowable rotational angle range signal,

logical product evaluating means coupled to said ignition enabling signal generating means and to said rotational angle range determining means for evaluating a logical product of said ignition enabling signal and said allowable rotational angle range signal for providing a logical product signal to said spark plug driving means, and

delay means for preventing occurrences of misfire cycles wherein an ignition enabling signal is not applied to said spark plug driving means, said delay means coupled to said rotational angle position signal generating means for delaying said rotational angle position signal by a predetermined time period for providing a delayed signal, and

logical sum evaluating means coupled to said delay means and to said logical product evaluating means for evaluating a logical sum of said delay signal and said logical product signal, said logical sum evaluating means connected for providing a logical sum signal to said spark plug driving means thereby generating an alternative ignition enabling signal for application to said spark plug driving means in cycles wherein said ignition enabling signal occurs outside of said allowable ignition timing range and is blocked by said ignition enabling means from application to said spark plug driving means.

4,520,782

FUEL PUMPING APPARATUS

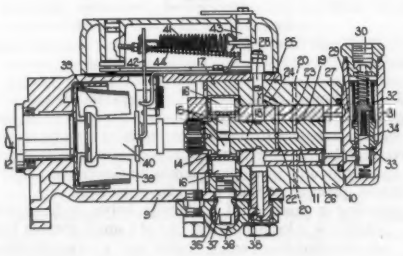
Ralph Holroyd, Dearborn Heights, and Peter O. Spiller, Sterling Heights, both of Mich., assignors to Lucas Industries Limited, Birmingham, England

Filed Mar. 1, 1982, Ser. No. 353,182

Claims priority, application United Kingdom, Apr. 10, 1981, 8111295

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—450 **13 Claims**



1. A liquid fuel injection pumping apparatus for supplying fuel to internal combustion engines comprising; a body part, a bore and a plunger reciprocable in the bore, a cam ring rotatably mounted in the body part having a cam lobe operably associated with the plunger for imparting inward movement to the plunger to pump fuel through a conduit to an outlet, a low pressure pump having an outlet connected to the plunger bore for supplying fuel to said bore during the filling stroke of the apparatus, valve means for controlling the outlet pressure of the pump so that it varies in accordance with the speed at which the apparatus is driven, a fluid pressure operable device

responsive to the outlet pressure of the pump and operably associated with the cam ring for controlling the angular setting of said cam ring, a throttle bore in said body part, an angularly adjustable throttle member mounted in said throttle bore, a groove on the peripheral surface of the throttle member and a port opening into the throttle bore at said groove, said port and groove constituting part of the flow conduit for fuel between the outlet of the pump and the plunger bore, means to vary the degree of registration of the groove and the port by altering the angular setting of the throttle member thereby to vary the quantity of fuel supplied to the plunger bore, at least one side edge of said groove being inclined to the axis of the throttle bore so that the degree of registration of the groove with the port will vary as the axial position of the throttle member is varied, a pivotal lever one end of which operatively engages said throttle member to serve as a stop to control the axial setting of the throttle member, a cam surface formed on the cam ring, a cam follower operatively engaging said cam surface, and the other end of said lever operatively engages said cam follower so that the axial setting of the throttle member can be varied by angular movement of the cam ring.

4,520,783

METHOD OF CONTROLLING FUEL INJECTION AND APPARATUS THEREFOR

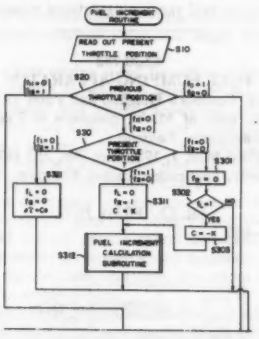
Souichi Matsushita; Kiyoshi Nakanishi, both of Susono, and Tokuta Inoue, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 30, 1984, Ser. No. 635,884

Claims priority, application Japan, Aug. 1, 1983, 58-140929

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—492 **10 Claims**



1. A method of controlling a fuel injection wherein a basic fuel injection quantity is calculated on the basis of an engine speed and an engine load and is corrected at least by an output incremental value determined in accordance with acceleration or deceleration of an engine thereby to determine a final fuel injection quantity, at least, comprising the steps of:

detecting a position of a throttle valve with regard to whether it is located within one of a small-opening region, an intermediate-opening region and a large-opening region;

correcting said basic fuel injection quantity in accordance with said output incremental value determined in such a manner that it becomes its maximum value when said throttle valve is switched over from said small-opening region to said large-opening region thereby to abruptly increase said basic fuel injection quantity, that it gradually approaches said maximum value when said throttle valve is switched over from said small-opening region to said intermediate-opening region thereby to gradually increase said basic fuel injection quantity, that it becomes substantially zero when said throttle valve is switched over form said large-opening region to said small-opening region thereby to terminate the increase of said basic fuel injection quantity, and that it is gradually attenuated toward substantially zero when said throttle valve is switched over from said large-opening region to said intermediate-opening region thereby to gradually decrease said basic fuel injection quantity.

4,520,784

METHOD OF AND APPARATUS FOR CONTROLLING FUEL INJECTION

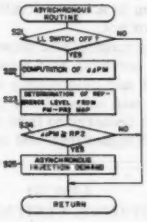
Toshiaki Isobe, Nagoya, and Teruo Fukuda, Kobe, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 2, 1984, Ser. No. 637,024

Claims priority, application Japan, Aug. 5, 1983, 58-143272; Aug. 5, 1983, 58-143273

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—492 **20 Claims**



1. In an internal combustion engine in which synchronous fuel injection is conducted at every predetermined crank angle and an asynchronous fuel injection is conducted regardless of a crank angle, a method of controlling a fuel injection comprising the steps of:

computing a variance of intake pressure in said engine;

comparing the computed variance with a reference level which is predetermined to get greater as the intake pressure becomes higher; and

increasing, in the case of detection of the variance of the intake pressure being greater than said reference level, a quantity of fuel to be injected.

4,520,785

GASEOUS FUEL SUPPLY AND CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

William H. Batchelor, Jensen Beach, Fla., assignor to Propane Carburetion Systems, Inc., Stuart, Fla.

Filed Feb. 1, 1984, Ser. No. 575,776

Int. Cl.³ F02M *21/02*

U.S. Cl. 123—525 **11 Claims**

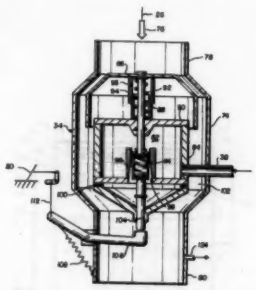
1. In a control system for a dual fuel supply system for an internal combustion engine including a primary liquid fuel supply, a high pressure secondary gas fuel supply, an air intake duct for the engine, a power controller for the engine including a power demand element movable in proportion to engine power demand, means for supplying the gas fuel to a first region of the intake air duct in proportion to the supply of liquid fuel to the engine, and a pressure regulator including a movable regulator valve for controlling the supply of gas fuel to said first region at a reduced, regulated pressure, the regulator valve controlled by a primary absolute pressure signal generated in response to intake duct flow conditions at said first region of said duct, the improvement comprising:

means for sensing and generating a secondary absolute pressure signal responsive to intake air flow rate in the intake duct at a second region different from the first region;

means for transmitting the secondary pressure signal to the pressure regulator;

means for modulating the secondary pressure signal in re-

sponse to movement of said engine power demand element so that the pressure signal is blocked upstream of the pressure regulator when the engine power demand element is at a full power position and is progressively released to communicate with the pressure regulator as the element moves away from the full power position towards a reduced power position;



means in the pressure regulator for influencing the movement of the regulator valve in response to said secondary pressure signal;

the final position of the regulator valve being determined by the balance of the influences exerted by the primary and secondary pressure signals.

4,520,786

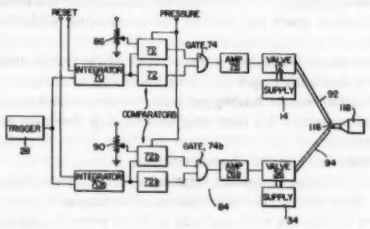
SONIC DISPERSION UNIT AND CONTROL SYSTEM THEREFOR

Arthur K. Thatcher, Merritt Island, Fla., and Ed R. McCarter, deceased, late of Maitland, Fla. (by Rebecca A. McCarter, executrix), assignors to Arthur K. Thatcher Revokable Trust, Merritt Island, Fla.

Continuation-in-part of Ser. No. 118,451, Feb. 4, 1980, Pat. No. 4,317,440, which is a division of Ser. No. 868,825, Jan. 12, 1978, Pat. No. 4,231,333, which is a continuation-in-part of Ser. No. 593,001, Jul. 3, 1975, Pat. No. 4,100,896, which is a division of Ser. No. 293,377, Sep. 29, 1972, Pat. No. 3,893,434. This application Feb. 23, 1982, Ser. No. 351,536

Int. Cl.³ F02M *29/00*

U.S. Cl. 123—536 **25 Claims**



6. A sonic dispersion system for controlling the provision of at least two materials from at least two separate material sources and for mixing said materials and providing a dispersion of said mixture from a single point source to a use apparatus comprising mounting means, sonic dispersion means mounted on said mounting means and including an active material dispersion surface for providing a material dispersion, material input means connected to separately supply material from each of said two material sources to said active material dispersion surface, said material input means including a first control means to control the flow of material from one source to said active dispersion surface and a second control means to control the flow of material from a second source to said active dispersion surface, and computer means connected to control the operation of at least one of said first and second control means to provide a material flow which varies as a function of variations in the operating condition of said use apparatus, said computer means including sensing means operative to provide sensing signals indicative of the operating condition of said use apparatus and control signal generating means connected to receive said sensing signals from said sensing means and operative in response thereto to provide control signals to control the operation of at least one of said first and second control means.

4,520,787

INTAKE AIR HEATING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

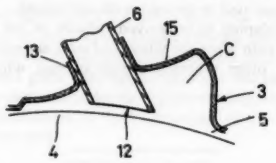
Minoru Midorikawa, Mitaka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 27, 1983, Ser. No. 565,652

Claims priority, application Japan, Dec. 28, 1982, 57-196484[U]

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—556 **10 Claims**



1. An intake air heating system for an internal combustion engine having intake and exhaust passages respectively, connected to said engine, an air cleaner connected to said intake passage and an outside air induction duct connected to said air cleaner, said intake air heating system comprising:

a manifold cover comprising edge portions surrounding the outer surface of said exhaust passage with a limited clearance for air inlet therebetween and at least one enlarged portion extending outwardly from said edge portions to form a heating chamber between said manifold cover and the outer surface of said exhaust passage, and

a heated-air induction pipe for connecting the inside of said cover with said outside air induction duct,

said induction pipe being inserted into said manifold cover and projecting towards the outer surface of said exhaust passage, the projecting length of said induction pipe inside of said cover extending at least more than half of the distance between the outer surface of said exhaust passage and the inner surface of the enlarged portion, whereby an effective heating chamber is formed with openings for air inlet only at said limited clearance and air outlet only at the end of said induction pipe, said chamber being formed by the manifold cover on the outer surface of said exhaust passage, whereby intake air drawn through said limited clearance is temporarily retained and heated in said heating chamber.

4,520,788

ROTATING WHEEL DRESSER

Larry E. Melvin, R.D. #1, Cambridge Springs, Pa. 16403

Filed Sep. 14, 1983, Ser. No. 532,211

Int. Cl.³ B24B *53/06*

U.S. Cl. 125—11 CD **13 Claims**

1. A wheel dresser having a base with a generally flat lower surface adapted to rest on a magnetic table of a grinding machine,

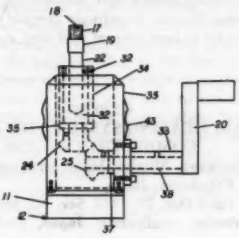
a vertical section attached to said base,

said vertical section extending upwardly therefrom,

a housing swingably attached to said vertical section and swingable about a horizontal axis,

an elongated generally cylindrical diamond impregnated tool having a flat dressing end means rotatably supported on said housing,

manually rotatable means on said housing to manually rotate said tool about its longitudinal axis,



said housing being adapted to be moved up and down relative to a rotating grinding wheel with a part of said flat end of said tool in contact with said wheel,

said tool adapted to be moved radially of the wheel in a vertical path when the wheel and table are moved relative to each other whereby a side of said wheel may be dressed.

4,520,789

SUPPORTS FOR HEATING BODIES INTENDED FOR ANNEALING FURNACES

André H. Rombouts, Rue de la Colline, 97, Ivoz-Ramet, Belgium (B-4120)

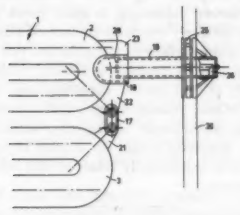
PCT No. PCT/BE83/00008, § 371 Date Nov. 23, 1983, § 102(e) Date Nov. 23, 1983, PCT Pub. No. WO83/03428, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 25, 1983, Ser. No. 560,984

Claims priority, application Luxembourg, Mar. 26, 1982, 84040

Int. Cl.³ F24C *3/00*

U.S. Cl. 126—91 A **7 Claims**



1. A support for a heating body for an annealing furnace, permitting the expansion of the heating body (1) without affecting its heating capacity or the satisfactory operation of the furnace, wherein a pivotal link means (17) joins upper and lower hairpin bends (2, 3) of the heating body to one another, a cup-shaped rest being attached to said upper hairpin bend, a tubular support arm (19) rigidly fixed in the wall of the furnace, said cup-shaped rest being adapted to slide on said tubular support arm.

4,520,790

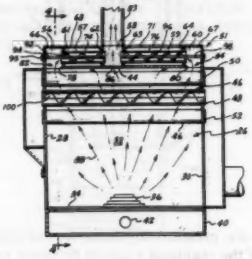
AIR HEATING FURNACE

Ronald L. Sagness, Bowbells, and Donald A. Peterson, Berthold, both of N. Dak., assignors to Neshem-Peterson, Inc., Berthold, N. Dak.

Filed Jul. 15, 1983, Ser. No. 514,084

Int. Cl.³ F24H *3/08*

U.S. Cl. 126—109 **9 Claims**



1. An air heating furnace comprising

a combustion chamber including a first end wall, a second end wall, and spaced apart sidewalls connected to said end walls,

burner means in said combustion chamber for burning fuel to create hot combustion gases,

flue means at a top portion of the furnace for exhausting combustion gases from the furnace,

a plurality of spaced-apart air flow conduits above said burner means and extending across said combustion chamber between said end walls, outside surface of said air flow conduits being in the path of travel of combustion gases from the burner means to the flue means,

a plurality of spaced-apart generally horizontal combustion gas flow conduits between the flue means and said combustion chamber, said combustion gas flow conduits having inlets communicating with said combustion chamber for receiving combustion gases and outlets communicating with the flue means,

chamber means for isolating the exterior of the combustion gas flow tubes with respect to their inlets and outlets,

said chamber means having an inlet for air to be heated and including means for directing air entering the inlet around the exterior of the combustion gas flow tubes to outlets at opposite sides of the chamber means,

outer wall means in spaced relation to the outside surface of each side wall of the combustion chamber, said outer wall means combining with said side walls to provide sidewall air flow spaces,

means in said side wall air flow spaces between said outer wall means and said combustion chamber walls to direct air from said chamber means downwardly and toward said first end of the furnace,

plenum means at said first end of the furnace for receiving air from said side wall air flow spaces and for directing the air through said air flow conduits,

plenum means at said second end of the furnace for receiving air from the air flow conduits, and

fan means for forcing air to be heated through the air flow passages of the furnace.

4,520,791

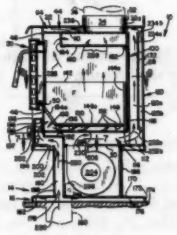
JACKETED WOOD STOVE

Joseph G. Chamberlain, 12350 SW. 124th, Tigard, Oreg. 97223

Division of Ser. No. 360,425, Mar. 22, 1982, Pat. No. 4,422,436, which is a continuation of Ser. No. 131,214, Mar. 17, 1980, abandoned. This application Oct. 14, 1983, Ser. No. 542,131

Int. Cl.³ F24B 7/00

U.S. Cl. 126—121 2 Claims



1. A wood stove comprising:

a firebox having top, bottom, rear, and side heat-exchanging walls;

the firebox including a frontal access opening and a door adapted to close the frontal access opening, the door having inner and outer walls spaced apart to define a door airspace and ambient air openings connecting the door airspace to the ambient air for internally convectively cooling the outer wall of the door;

a jacket surrounding the firebox and spaced outwardly from the firebox walls, the jacket including a bottom jacket wall and upstanding rear and side jacket walls defining an airspace around at least a substantial portion of the firebox;

air inlet means in the bottom wall of the jacket for admitting ambient air into the airspace beneath the bottom wall of the firebox;

air outlet means in the upstanding sidewalls of the jacket for air warmed in the airspace to flow outwardly from the airspace;

baffle means within the airspace extending along the side and rear jacket walls and spaced between the firebox and jacket to divide the airspace into inner and outer portions for insulating the upstanding side and rear walls of the jacket from heat transmitted into the airspace from the firebox;

the jacket including a top wall spaced above the top wall of the firebox to define an upper airspace portion,

the baffle means terminating below the top wall of the jacket;

the air outlet means including a first elongated outlet opening extending horizontally along an upper margin of each of the sidewalls of the jacket adjacent an upper edge of the baffle so that the warmed air can flow in the upper airspace portion and laterally out of the jacket through the first elongated outlet openings;

a pedestal disposed under the bottom jacket wall and enclosing the air inlet means; and

a blower positioned within the pedestal for drawing ambient air inwardly through the air inlet means into the airspace for assisting the flow of the warmed air outwardly from the air outlet means.

4,520,792

GRATE BARS FOR USE IN THE GRATES OF INDUSTRIAL FURNACES AND THE LIKE

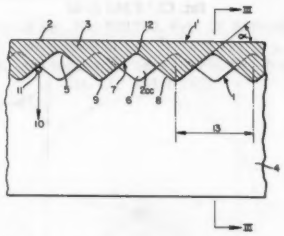
Erich Weber, Munich, Fed. Rep. of Germany, assignor to Martin GmbH für Umwelt- und Energietechnik, Munich, Fed. Rep. of Germany

Filed Aug. 22, 1984, Ser. No. 643,284

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330637

Int. Cl.³ F23H 7/08

U.S. Cl. 126—175 16 Claims



1. A grate, particularly for use in industrial furnaces, comprising a pair of neighboring elongated grate bars at least one of which is movable longitudinally with reference to the other grate bar, said grate bars having adjacent marginal zones including serrated undersides having alternating teeth and tooth spaces, as considered in the longitudinal direction of the respective grate bars.

4,520,793

FOLDABLE, INSULATED SOLAR WATER HEATER

Charles P. Hall, 5815 Bennett Valley Rd., Santa Rose, Calif. 95404

Filed Jul. 26, 1983, Ser. No. 517,277

Int. Cl.³ F24J 3/02

U.S. Cl. 126—426 3 Claims

1. A foldable, flexible, unitary body container for heating water with the sun, the container having opposed first and second ends and comprising:

(a) an outside front wall formed of clear, flexible plastic;

(b) a rear wall diametrically opposed to the front wall, the rear wall comprising:

(i) an inner layer of dark flexible plastic;

(ii) an outer layer of reflective flexible plastic which is reflective on its outer face; and

(iii) a middle layer of flexible insulating foam sandwiched between the inner and outer layers;

wherein the front wall and the inner and outer layers of the rear wall are bonded together at their periphery to form a container with a unitary body;

and wherein the front and rear walls together define a chamber for containing water to be heated such that the water

is in direct contact with the front wall and the inner layer of the rear wall; and

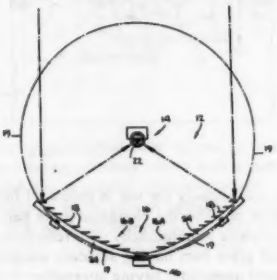
(c) an inlet and an outlet for placing water into and removing water from the container.

4,520,794

SOLAR ENERGY CONCENTRATING SLAT ARRANGEMENT AND COLLECTOR

Virgil Stark, New York, N.Y., and Pierre Genequand, Geneva, Switzerland, assignors to North American Utility Construction Corporation, New York, N.Y.

Filed Mar. 5, 1982, Ser. No. 354,930
Int. Cl.³ F24J 3/02
U.S. Cl. 126—438 **14 Claims**



1. Apparatus for collecting solar energy comprising:

at least one concentrator comprising a plurality of solar energy reflective slats each being of generally rectangular cross-section having a planar solar energy reflective surface, the slats having longitudinal axes and being generally disposed with their axes extending about a portion of a circle to direct solar energy impinging on the slats into a concentrated elongated target located forwardly of the concentrator relative to the travel of solar energy to the concentrator and within the circumference of the circle, the slats being grouped in a plurality of series, the slats within each of said series being disposed at the same angle to respective tangents of the circles as the other slats in the respective series; and

a collector including at least one elongated conduit adapted to pass a fluid therethrough and having a longitudinal axis extending generally parallel to the axes of the slats, the collector being disposed within the circumference of the circle in spaced relationship to the concentrator forwardly of the concentrator so as to receive the solar energy of the concentrated target of the concentrator.

4,520,795

SOLAR COLLECTOR HAVING TANK AND GLAZING CONSTRUCTION

William A. Parkyn; Horace W. Ladd, and Andrew M. Mellon, all of 1424 W. 259th St., Harbor City, Calif. 90710

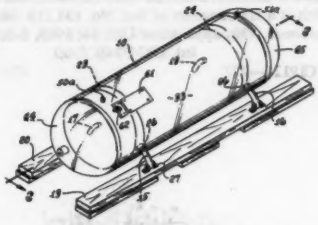
Filed Dec. 9, 1983, Ser. No. 559,051
Int. Cl.³ F24J 3/02
U.S. Cl. 126—443 **24 Claims**

1. In apparatus for collecting and absorbing solar radiant energy, for storing same, the combination comprising energy

(a) metal tank which absorbs solar radiant and transfers heat to liquid in the tank, the tank having a side wall and a first end wall,

(b) tank support means including leg structure projecting away from the tank for supporting same, and

(c) translucent glazing shell means supported by the tank and having a side wall extending about and spaced from the tank side wall, the shell means including at least one dome in alignment with said tank end wall and spaced therefrom, said shell means adapted to pass radiant solar energy to impinge on the tank side wall and end wall,



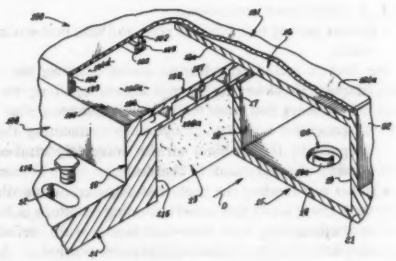
(d) said leg structure extending through at least one opening defined by the shell means.

4,520,796

LIGHTWEIGHT SOLAR COLLECTOR

J. Michael Slaminski, 13567 Bear Valley Rd., Moorpark, Calif. 93021, assignor to J. Michael Slaminski and William W. Haefliger, both of Pasadena, Calif., a part interest

Filed Mar. 26, 1984, Ser. No. 593,649
Int. Cl.³ F24J 3/02
U.S. Cl. 126—445 **14 Claims**



1. Solar collector comprising, in combination

(a) a first plastic sheet, extending generally horizontally forming multiple parallel branch ducts extending in a longitudinal direction through the sheet length,

(b) a second single plastic sheet extending generally horizontally,

(c) means mounting the second sheet on the first sheet to substantially cover the first sheet and to provide a space between the sheets, said means including legs between the first and second sheets,

(d) the second sheet being transparent so that solar radiation impinging on the second sheet will pass through it and onto the first sheet for heating liquid passing through said ducts,

(e) a third plastic body attached to the first sheet and defining a first header duct communicating with said branch ducts at one end of the first sheet,

(f) a fourth plastic body attached to the first sheet and defining a second header duct communicating with said branch ducts at the opposite end of the first sheet,

(g) said third and fourth plastic body ducts extending laterally and horizontally and having lower portions below the level of said first plastic sheet, said second sheet horizontally covering said third and fourth plastic bodies,

(h) there being insulation space below said first sheet and between said third and fourth plastic bodies,

(i) said first sheet having integral support flanges which extend longitudinally and project downwardly at opposite laterally spaced ends of said insulation space, for attach-

ment to a roof, said second sheet extending over said flanges.

4,520,797

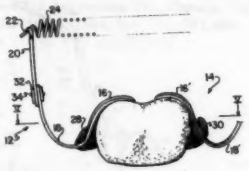
COLLATERAL LIGAMENT RETRACTOR

Thomas D. Petersen, 9680 Alto Dr., La Mesa, Calif. 92041

Continuation of Ser. No. 269,792, Jun. 3, 1981, abandoned. This application Jul. 15, 1983, Ser. No. 514,162

Int. Cl.³ A61B *17/02*

U.S. Cl. 128—20 **5 Claims**



1. A collateral ligament retractor assembly for retracting a pair of collateral ligaments for aiding and providing acess to a knee structure for knee surgery, comprising:

a pair of substantially symmetrical individually manipulable retractor members, each retractor member defined by generally S-shaped lever means including curved finger means formed at one end thereof for independent insertion between a collateral ligament and a tibia plateau and partially encircling and extending behind and engaging the tibia plateau thereby providing fulcrum means comprising a pivot point about which said retractor member pivots in use, and including curved arm means curving around past said one end to a position outside the collateral ligament and terminating at a position behind and to one side of said one end and said tibia, and tension means connected between the arm means of said retractor members behind a knee structure after said retractor members have each been independently inserted in place said tension means pivoting said retractor members about their fulcrum means thereby holding the ligaments in a retracted position away from the tibia for providing access thereto.

4,520,798

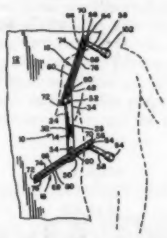
SELF ACUPRESSURE METHOD

Tommy K. Lewis, 1605 Henry St., Huntington, Ind. 46750

Division of Ser. No. 317,991, Nov. 4, 1981, Pat. No. 4,452,237. This application Mar. 5, 1984, Ser. No. 586,411

Int. Cl.³ A61H *39/04*

U.S. Cl. 128—24 R **5 Claims**



5. A method of self-administering therapeutic pressure to various points or areas of the body in order to temporarily relieve certain ailments, utilizing an apparatus having a plate generally mounted vertically on a wall structure and including at least one arm rotatably and slidably connected to the plate, the arm having a bar extending outwardly therefrom, there being an appropriate size knob member on a free end of the bar; the method comprising:

sliding and rotating the arm to position the knob member properly at the body area to be treated;

securing the arm in the desired position;

positioning the body area adjacent the knob member; and

with the apparatus supported against the wall structure, pressing the body area against the knob member.

4,520,799

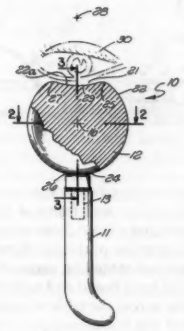
FACIAL TREATMENT DEVICE

Sandra J. Kruger, 2901 Avenida Caballeros, Palm Springs, Calif. 92262

Continuation of Ser. No. 580,753, Feb. 17, 1984, abandoned, which is a continuation of Ser. No. 415,750, Sep. 7, 1982, abandoned. This application Sep. 7, 1984, Ser. No. 648,610

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—67 **7 Claims**



7. A facial treatment device comprising:

a handle; and

a head carried by said handle for contacting a person's skin and which is formed of a highly heat conductive metal;

said head having two similarly curved opposite side surfaces generally parallel to one another, one of which faces in a first direction along a predetermined first axis and is curved substantially spherically and concavely about a first center located essentially on said axis;

the other of said side surfaces facing in the opposite direction along said axis and being curved substantially spherically and convexly about a second center located essentially on said axis and spaced from said first center;

said head, as viewed in a plane disposed transversely of said axis, having an outer edge surface extending essentially about said axis and facing generally away from the axis;

said handle being elongated and connected at a first end thereof to the periphery of said head, at a first side of said first axis, and projecting away from said first axis;

said outer edge surface of the head, as viewed in said plane disposed transversely of said first axis, having a portion defining a recess which curves smoothly inwardly toward said first axis at a location essentially diametrically opposite the location of said handle with respect to said first axis and which extends essentially arcuately about a second axis offset from said first axis;

said outer edge surface of the head having two additional portions at opposite sides of said first axis which extend between said recess and opposite sides of said handle, and which are curved convexly and essentially arcuately about said first axis as viewed in said transverse plane;

said head as viewed in said transverse plane being substantially circular about said first axis except at the location of said handle and said recess;

said outer edge surface of the head, as viewed in planes containing said first axis, being rounded convexly and smoothly in a relation merging with and joining said opposite side surfaces along essentially the entire periphery of said head except at the location of said handle, and including the portion of said outer edge surface defining said recess and said two additional portions extending between the recess and handle;

the periphery of said head being thinner at the location of said recess than at said additional portions of said outer edge surface extending between said recess and said handle.

4,520,800

PATIENT TREATMENT TABLE

Frank P. Kowalski, Des Plaines, Ill., assignor to Standex International Corporation, Salem, N.H.

Filed May 9, 1983, Ser. No. 493,145
Int. Cl.³ A61F *5/00*
U.S. Cl. 128—72 **12 Claims**

1. A patient treatment table, comprising a table frame, a hip board fixedly secured to said frame, a head board fixedly secured to said frame and spaced from said hip board, a transparent, flexible arch member positioned between said head board and said hip board and extending across the entire width of the space between said head board and said hip board, a rigid slide member extending across the table adjacent to and beneath the inner edge of said hip board and pivotally connected to one end of said arch member, means pivotally connecting said other end of said arch member to said frame adjacent said head board, and means for moving said slide member in a horizontal plane so that said one end of said arch member moves away from said fixed hip board and said arch member is bowed upwardly above the surface of said hip board and said head board, said arch member when in said bowed positon being sufficiently rigid to support by itself a substantial weight placed thereon.

4,520,801

CERVICAL COLLAR

Max Lerman, 1950 Carla Ridge, Beverly Hills, Calif. 90210

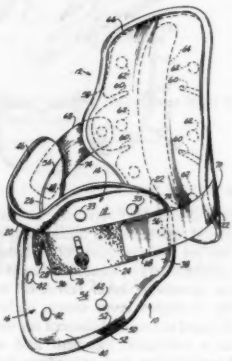
Filed Jul. 8, 1983, Ser. No. 511,841
Int. Cl.³ A61F *5/01*
U.S. Cl. 128—75 **12 Claims**

1. A cervical collar having an improved chin support comprising:

an upper section formed as a thin, semi-rigid upper shell having (a) a generally U-shaped chin-supporting front portion shaped to conform to a patient's chin and having side portions extending along the patient's lower jaw to rear portions in the vicinity of the rear lower jaw, and (b) a generally U-shaped lower bridge member having side portions extending along opposite sides of the patient's neck and a front portion extending across the front of the patient's neck, the bridge member extending generally normal to the U-shaped chin supporting portion of the upper section; and a layer of a resilient open cell containing material on an inside face of the upper portion of the shell;

a lower section formed as a thin, semi-rigid lower shell having an upper portion for overlying the lower portion of the patient's neck generally around the vicinity of the collar bone, and a lower portion for resting on a front portion of the patient's chest region; and a layer of a resilient open cell containing material on an inside face of the lower shell;

means attaching the upper and lower sections to one another so that one section is movable relative to the other and for retaining the two sections affixed to each other with the bridge member overlapping the upper portion of the lower section, the two sections being movable to adjust the distance the lower section can be moved toward or away from the upper section to adjust the combined upper and lower sections to different neck sizes; and



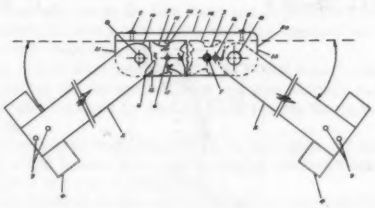
fastening means extending between the bridge member and the upper portion of the lower section for being loosened to allow said relative movement between the two sections and for being tightened to hold the two sections in a desired relative position, with the fixed bridge member providing a reinforcing bridge between the upper portion of the lower section and the chin-supporting portion of the upper section.

4,520,802

BI-AXIAL ORTHOTIC DEVICE

James D. Mercer, 100 Silverwood Dr., Lafayette, Calif. 94549, and Gordon Aaserude, 444 La Palomba, El Sobrante, Calif. 94803

Filed Sep. 30, 1983, Ser. No. 537,795
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 C **5 Claims**



1. A bi-axial orthotic device having

(1) a center bar having pivot points for attachment of independent flex bars one near each end and a pair of independent indexing blocks removably positioned therebetween;

(2) said flex bars pivotally attached through pivoting ends on each flex bar to each end of the center bar and extending longitudinally therefrom terminating in transverse anchor plates, the attached pivoting end of the flex bars contoured to cooperate with the indexing blocks each in close

proximity and positioned to coact with said indexing blocks;

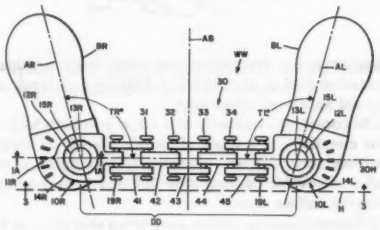
(3) independent index blocks securely but removably attached and positioned on said center bar to cooperate with said attaching end of said flex bars each index block having a plurality of sides each side a cam contoured for cooperation with said pivoting end of said flex bar to regulate the movement and angle of said flex bar.

4,520,803

ORTHOPAEDIC APPARATUS

Thomas A. Quest, 9205 Timberline Dr., Omaha, Nebr. 68152

Filed Feb. 21, 1984, Ser. No. 581,889
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 A **7 Claims**



1. Orthopaedic apparatus for comfortably maintaining a selectable eversion-angle between the sole-axes of a longitudinally separated pair of shoes, the eversion-angle bisection extending directionally laterally and substantially perpendicular to said longitudinal shoes spacing, said apparatus comprising:

A. a pair of shoe-connectors and each including a shoe-stud extending along a stud-axis, means for attaching the shoe-connectors to the shoes pair in a condition wherein the stud-axes intersect the two shoes at similar locations and are substantially parallel to each other, each shoe-connector including a plate member angulary rotatable about the shoe-stud and the plate member carrying a laterally extending primary-pivot outwardly offset from the shoe-stud, and means for maintaining a selected angular rotation between the plate member at the primary-pivot and the stud-axis; and

B. a longitudinally extending splint having two longitudinally separated positions thereof pivotably connected to said two laterally extending primary-pivots whereby a longitudinally extending finite splint-length exists between said two primary-pivots, said splint-length being interrupted by at least two laterally extending splint-pivots and being substantially laterally rigid throughout said splint-length including at the splint-pivots, whereby said splint-length includes at least three intervening splint-links having a single direction of free movement restricted to a movement plane substantially perpendicularly intersecting the two primary-pivots and the splint-pivots.

4,520,804

DOUBLE-LOCKING RATCHET FOR ORTHOPEDIC BRACE

Michael A. DiGeorge, P.O. Box 563, Sulphur, La. 70663

Filed Aug. 4, 1981, Ser. No. 289,897
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 C **9 Claims**

1. An improved joint for an orthopedic brace comprising:

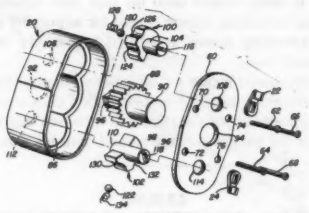
casing means;

ratchet means substantially contained within said casing means;

upper leg brace attachment means for fixedly securing said casing means to an upper leg brace associated with said orthopedic brace;

lower leg brace attachment means for fixedly securing said casing means to a lower leg brace associated with said orthopedic brace; and

selectably positionable ratchet control means for providing alternative operating characteristics to the joint so as to permit selective pivotal movement between said upper and lower leg braces, said alternative operating characteristics including (a) pivotal movement of the braces in one direction and locking of the braces against pivotal move-



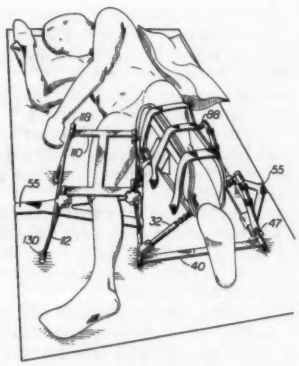
ment in the other direction; (b) pivotal movement of the braces in said other direction and locking of the braces against pivotal movement in said one direction; (c) pivotal movement of the braces both in said one direction and in said other direction; and, (d) locking of the braces against pivotal movement both in said one direction and in said opposite direction, wherein said ratchet means includes a ratchet wheel and said ratchet control means includes first and second pawl means selectively engageable with said ratchet wheel to effectively control said operating characteristics.

4,520,805

ABDUCTOR TURNTABLE

Valerie A. St. Vincent, 1750 Prefumo Cyn. Rd., #51, San Luis Obispo, Calif. 93401; Frank B. Heinen, and Steven J. Rinell, both of San Luis Obispo, Calif., assignors to Valerie St. Vincent, San Luis Obispo, Calif.

Filed Jan. 24, 1983, Ser. No. 460,592
Int. Cl.³ A61F *3/00, 5/00*
U.S. Cl. 128—80 R **8 Claims**



8. Apparatus to facilitate turning a patient lying on his back in a bed onto one side while maintaining the opposite leg in a chosen degree of abduction, a chosen degree of rotation, and a minimal degree of flexion, said apparatus comprising in combination:

a splint for supporting the opposite leg of the patient, said splint including two elongated arched shells connected by a hinge, the axis of the hinge extending generally in the direction of elongation;

elevating means attached to said splint for elevating the opposite leg of the patient by constraining said splint to move along an arcuate path from an initial position on the bed to an elevated position as the patient is being turned onto his side, said elevating means including abduction adjustment means for adjusting the orientation of said splint to an orientation chosen to maintain the opposite leg of the patient at a chosen degree of abduction as the patient is being turned onto his side, said elevating means further including support means for adjustably supporting said elevating means at any of a plurality of elevated positions; and,

splint adjustment means for adjustably affixing said splint to said elevating means at an orientation chosen to maintain the opposite leg of the patient at a chosen degree of rotation as the patient is being turned onto his side.

4,520,806

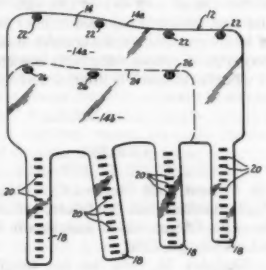
SPLINT AND METHOD OF USING SAME

Larry Miller, 465 Oliveta Pl., La Canada, Calif. 91011

Filed May 18, 1983, Ser. No. 495,630

Int. Cl.³ A61F 5/04

U.S. Cl. 128—87 R **4 Claims**



1. A device for use in splinting fractures and dislocations, comprising:

(a) a generally planar shaped body portion yieldably deformable from a first open position to a second closed position wherein the area of the fracture or dislocation is closely surrounded by said body portion;

(b) fastening means for securing said body portion in said second position, said means comprising:

(1) a plurality of longitudinally spaced apart, elongated straps extending transversely of said body portion, each said strap having a plurality of spaced apart apertures formed therein; and

(2) a plurality of spaced apart first locking elements affixed to said body portion along a first longitudinally extending line, said elements being receivable within said apertures for interconnecting said straps to said body along said first line; and

(c) indicia dividing said body portion into first and second areas, said second area being encompassed within said first area, said device also being provided with a plurality of second, longitudinally spaced apart locking elements, said first locking element being disposed along a first line located proximate an edge portion of said first area and said second locking element being disposed along a second line disposed proximate an edge portion of said second area.

4,520,807

OBSTETRIC DEVICE AND METHOD

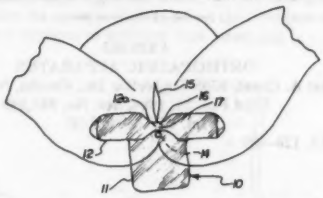
Carl W. Rotter, 6461 Brookedge Ct., Dublin, Ohio 43017

Continuation of Ser. No. 275,857, Jun. 22, 1981, abandoned.

This application Apr. 29, 1983, Ser. No. 487,999

Int. Cl.³ A61F 5/46

U.S. Cl. 128—132 D **2 Claims**



1. Apparatus for minimizing and most likely eliminating contamination during an obstetrical delivery and repair on a patient, said apparatus comprising

a shield consisting essentially of a drape portion which consists essentially of a single sheet of material, an adhesive carrying surface zone connected to said drape portion, and a removable backing strip adhered to said adhesive carrying surface zone,

said adhesive carrying surface zone being shaped so as to be locatable between the vagina and the anal opening without covering either the vagina or the anal opening and being pressable into tight engagement with the perineum and perineal area for forming a physical barrier between the vagina and the anal opening, and the drape portion extending away from the adhesive carrying surface zone and being positioned over the anal opening when said adhesive carrying surface zone is adjacent to and in facing relation with the perineum and the perineal area and when the patient is positioned for obstetrical delivery, so that said adhesive carrying surface zone physically blocks flow of fecal material from the anal opening to the vagina while allowing flow of fecal material from the anal opening and said drape portion directs fecal material from the anal opening away from the operative area during obstetrical delivery and repair,

said adhesive carrying zone being bow-tie shaped, being narrow enough in its central portion to fit between the anus and the vagina, and having adequate adhesive in its wider portions to support the shield, the adhesive carrying zone being longer than the width of said drape portion, and the width and length of said drape portion being equal to each other.

4,520,808

INHALATION EXPOSURE APPARATUS

Raphael J. LaBauve, West Hartford, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 10, 1983, Ser. No. 474,098

Int. Cl.³ A61M 15/00

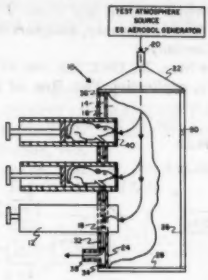
U.S. Cl. 128—200.14 **19 Claims**

1. An inhalation apparatus for exposing small laboratory animals to a test atmosphere comprising an animal holding tube means capable of positioning the nose of an animal at a fixed point within said tube means, said tube means totally enclosing the animal while allowing free movement of the animal within a space enclosed by the tube means without otherwise fettering said animal, said tube means being further provided with:

(a) test atmosphere inlet means located in the vicinity of said nose; and

(b) exhaust outlet means located such that the test atmo-

sphere can be inhaled by the animal then exhausted rearward of said nose of the animal so that said animal is



exposed to a uniform concentration of test atmosphere containing substantially no exhaled materials.

4,520,809

ANAESTHETIC INDUCTION DEVICE

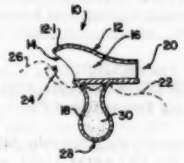
Magdel N. de Greef, 13 Nederburgh St., Welgemoed, Bellville, Cape Province, and Ian D. Smit, 26 Campbell St., Observatory, Cape Town, Cape Province, both of South Africa

Filed Jan. 12, 1983, Ser. No. 457,258

Claims priority, application South Africa, Jan. 12, 1982, 82/0183; Oct. 11, 1982, 82/7424

Int. Cl.³ A61M *15/00*

U.S. Cl. 128—200.24 **4 Claims**



1. A gas induction device for use in anaesthetizing a child, which device comprises:

gas delivery and directing means having a flared terminal portion which defines an outlet opening adapted to be positioned in close proximity to the child's nostrils and a widening gas flow passage leading to the outlet opening, said gas delivery and directing means including means for fluidically communicating said gas flow passage with an external source of anaesthetizing gas and being shaped and dimensioned to lie over the child's face except for the child's nostrils; and

an artificial teat connected to said gas delivery and directing means in such a manner that, when the teat is located in a sucking position in the child's mouth, said gas delivery and directing means is thereby located so that the outlet opening is in close proximity to the child's nostrils, whereby gases flowing through the passage to the outlet opening are delivered from the outlet opening and directed towards the nostrils.

4,520,810

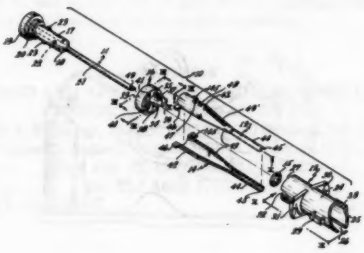
APPARATUS FOR PERFORMING AN EMERGENCY CRICOTHYROTOMY

Sol Weiss, 17227 Quesan Pl., Encino, Calif. 91316

Continuation of Ser. No. 307,764, Oct. 2, 1981, abandoned. This application Apr. 24, 1984, Ser. No. 603,369

Int. Cl.³ A61B *17/32*; A61M *16/00*

U.S. Cl. 128—200.26 **1 Claim**



1. A surgical device adapted to puncture human skin for performing an emergency tracheostomy comprising: a housing, a hollow needle insertible in and retained in said housing and having a proximal end portion and a distal end portion of a reduced cross-sectional area, said distal end portion of said needle comprising at least two sections which, taken together, define a throughbore and terminate in a blunt distal end; spring means for holding said sections of said distal end portion of said needle together and to enable said sections of said distal end portion of said needle to be separable from each other and expand radially from the said reduced cross-sectional area of said distal end portion; a stylet of lesser cross-sectional area than said distal end portion and insertible in said throughbore through said needle without expansion of said sections, said stylet having a distal cutting end for limited projection beyond said blunt distal end of said needle for a cooperative insertion of the distal ends of the needle and stylet into a skin incision, and a wider main body portion on the proximal end thereof; first indexing means on the proximal end of the housing and cooperative second indexing means on the main body portion of said stylet; an airway tube movable through said needle, subsequent to removal of the stylet from the proximal end portion thereof to the distal end thereof, said airway tube being of larger cross-sectional area than the said cross-sectional area of said distal end portion of said needle whereby to expand radially said distal end portion of said needle from its normal cross-sectional area as said airway tube is moved through the distal end portion and distal end of said needle, said needle including guiding means for guiding said airway tube through said needle and camming said needle sections apart gradually and progressively before the tube reaches the skin level, said guiding means including an intermediate portion on each of the needle sections, each intermediate portion of said needle sections having an elongated tapered internal area between said proximal end portion and said distal end portion thereof, said internal tapered area being defined by elongated protrusions extending along said intermediate portion and extending interiorly thereof for guidance of said airway tube from the proximal end portion into the distal end portion such that, when said needle sections have their ends inserted into the trachea of a patient, said airway tube engages said guiding means and said guiding means cams said needle sections apart gradually and progressively before the airway tube reaches the skin level.

4,520,811
PULMONARY RESUSCITATOR

Daniel S. White, Independence, and Jerald L. Nave, Oak Grove, both of Mo., assignors to Grove Medical Supply, Inc., Oak Grove, Mo., by said Jerald L. Nave

Division of Ser. No. 232,652, Feb. 8, 1981, Pat. No. 4,449,525.
This application Feb. 28, 1984, Ser. No. 584,326
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—203.11 1 Claim

1. An improved pulmonary resuscitator, for use in providing flow communication between a rescuer and a victim; said resuscitator having an air tube and a valve positioned intermediate ends of said tube; said valve comprising:

(a) a valve body, including:

(1) first and second valve body members, each valve body member having a surrounding side wall portion and an end wall portion; said valve body members being slidably interconnected and defining an inner cavity therein such that said end wall portions are located on generally opposite sides of said cavity, said valve body second member surrounding wall portion having an end edge adjacent said valve body first member end wall portion when said valve body members are interconnected;

(2) a fluid flow passageway through said valve body first member end wall portion communicating with said air tube adapted to allow air to pass from the rescuer to the valve body inner cavity;

(3) an aperture through the second valve body member end wall portion communicating with said air tube and adapted to allow air to flow from said valve body inner cavity to the patient;

(4) an exhaust tube having an end thereof extending through said valve body member side walls to said inner cavity, said exhaust tube communicating with ambient air to allow air to flow from said inner cavity to said ambient air; said exhaust tube end beveled in a direction toward said valve body first member end wall portion;

(b) a grid positioned in said passageway;

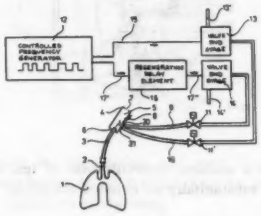
(c) a butterfly disc having an outer margin and a center flap portion integrally hinged therewith positioned within said inner cavity; said outer margin being snugly held between said second body end edge and said first member end wall and said flap portion is adapted to alternately seal over said passage and said exhaust tube end; said center flap being continuously presented to said stream flow through said valve body; and

(d) said center flap portion overlying said exhaust tube end such that upon exhalation of air from said rescuer, said rescuer exhaled air is adapted to pass through said valve body to said patient; said center flap overlying said passageway and abuttingly engaging said grid such that upon exhalation by said patient, said patient exhaled air is adapted to pass through said exhaust tube to said ambient air.

4,520,812
METHOD AND APPARATUS FOR CONTROLLING A PRESSURE LEVEL IN A RESPIRATOR

Lutz Freitag; Michael Wendt, and Franz J. Dankwart, all of Münster, Fed. Rep. of Germany, assignors to Drägerwerk AG, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,145
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212097
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—204.25 14 Claims

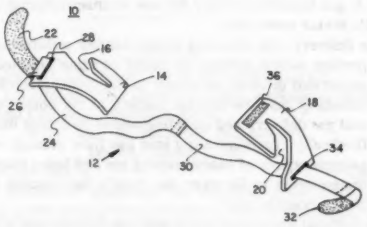


1. An apparatus for connecting a respirator through a tracheal tube to a person's trachea, comprising a tracheal tube adapted to be connected to the person's trachea, an attachment tube having one end connected to said tracheal tube and having a through bore defining an interior cavity, said bore having an opposite opening at one end to atmosphere and an opening at the opposite end into which the tracheal tube extends, a connection for fresh breathing air extending into said attachment tube from a side thereof, and at least two separate gas jet pipes opening into the cavity and each having a gas jet nozzle one of which is directed generally toward said tracheal tube and the other of which is directed in substantially an opposite direction, said connection for fresh breathing air including a fresh gas supply line having a rim portion interconnected with said attachment tube that is located between the opposite opening of said attachment tube and the other of said nozzles and spaced from the other of said two gas jet nozzles which is directed away from said tracheal tube by from 20 to 100 mm.

4,520,813
ENDOTRACHEAL TUBE HOLDER

Michael S. Young, 673 Dream Island Rd., Longboat Key, Fla. 33548

Filed Oct. 17, 1983, Ser. No. 542,444
Int. Cl.³ A61M *25/02*
U.S. Cl. 128—207.17 7 Claims



1. An endotraceal tube holder, comprising a pair of identical curved, plate-like hooking members adapted to overlie one another and each having first and second opposite ends and first and second opposite sides, one of said hooking members having a dogleg opening extending inwardly from said first side thereof toward said first end thereof, the other of said

hooking members having a dogleg opening extending inwardly from said second side thereof toward said first end thereof whereby, when said holder is used, said openings receive and engage the same endotracheal tube, and a face and neck encircling attachment band connected to said ends of each of said hooking members.

4,520,814

LASER-RESISTANT BACK-UP PAD

Vaughan B. Weeks, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

Filed Sep. 28, 1982, Ser. No. 426,109
Int. Cl.³ A61B *17/36*
U.S. Cl. 128—303.1 **3 Claims**

1. A laser-resistant back-up pad for insertion between the layers of tissue incised by a laser during surgery comprising:

an elastomer substrate having a first surface adapted to face the interior of the body of the patient and an opposite second surface adapted to face the exterior of the body of the patient;

a smooth laser-reflective coating comprised of a mixture of an elastomer and a laser-reflective material permanently bonded to the second surface of said elastomer substrate; and

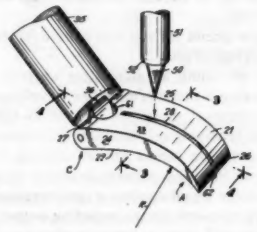
a layer of liquid absorbing non-laser reflective material bonded to said coating such that said laser reflective coating is sandwiched between said elastomer substrate and said liquid absorbing layer.

4,520,815

HAND SUPPORTED SURGICAL INSTRUMENT

Gerald P. Marinoff, Eight Rockford Dr., West Nyack, N.Y. 10994

Continuation-in-part of Ser. No. 389,842, Jun. 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 199,693, Oct. 23, 1980, Pat. No. 4,340,059. This application Jun. 21, 1983, Ser. No. 506,427
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—303 R **13 Claims**



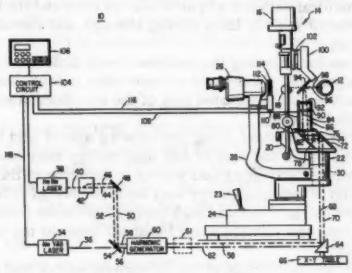
1. A hand supported instrument for assisting in the formation of ophthalmological incisions comprising a plate member having opposing side walls, opposing end walls, the distance between said end walls forming a length dimension, the distance between said side walls forming a width dimension, said length dimension being greater than said width dimension, said plate member having a bottom surface adapted to rest upon the surface of the human eye, said bottom surface being curved so as to conform to the normally curved surface of the human eye, no more than one longitudinally oriented slot extending through said plate to serve as a guide for a knife blade positioned in said slot, said plate member having a top surface spaced from said bottom surface by the thickness of said plate member and serving as means for controlling penetration of said knife blade through said slot, the thickness of said plate member varying from a minimum at a first end of said slot to a maximum at the other end of said slot, and means comprising a handle connected to said plate member at an end wall thereof closest to said second end of said slot for holding said plate member in a desired position on the human eye.

4,520,816

METHOD AND APPARATUS FOR DELIVERING LASER ENERGY FOR OPHTHALMIC USE

Ronald A. Schachar, 1020 N. Highway 75, Denison, Tex. 75020, and Stuart A. Solin, 1740 Shaker Blvd., Okemos, Mich. 48864

Filed Jan. 12, 1983, Ser. No. 457,433
Int. Cl.³ A61B *3/00, 17/36*
U.S. Cl. 128—303.1 **2 Claims**



1. An apparatus for delivering high power laser energy to the eye for surgical operations thereon comprising:

a hollow cylindrical member mounted on and perpendicular to a base, the interior of said cylindrical member communicating with the underside of said base;

a biomicroscope for viewing the eye and mounted for movement about a rotational axis to traverse a first arc, said rotational axis corresponding to the longitudinal axis of said cylindrical member;

a slit lamp mounted for movement about said rotational axis to traverse a second arc;

a Neodymium Yttrium-Aluminum Garnet laser for generating a high energy laser beam directed parallel to the plane of said base;

a control circuit for controlling the duration of said high energy laser beam;

a Helium Neon laser for generating a low power laser beam;

a birefringent crystal disposed in the path of said low energy laser beam for generating the ordinary and extraordinary rays thereof, said rays being parallel and having a defined distance therebetween;

means for mixing the output of said high energy laser and said birefringent crystal such that said high energy laser beam is coexistent with one of the beams output by said birefringent crystal;

a harmonic generator disposed in the path of the combined high and low energy laser beams for generating harmonics of said high energy laser beam;

a pentaprism mounted below said base and proximate the longitudinal axis of said cylindrical member and disposed in the path of the laser beams output by said harmonic generator for providing an orthogonal deflection thereof upward into the interior of said cylindrical member;

means for adjusting the position of said pentaprism to direct said deflected beams along said rotational axis;

means for optically directing the output of said pentaprism along said rotational axis to intersect the illumination path of said slit lamp at a point radially disposed from said rotational axis such that said intersection point is maintained constant for all rotational angles of said slit lamp;

a Gallilean beam expander disposed in the path of said high and low energy laser beams prior to said intersection point;

a focusing lens disposed in the path of said high and low energy beams between said intersection point and said beam expander;

a replaceable filter disposed in the path of said high and low energy beams between said focusing lens and said intersection point for selecting one of the harmonics of said high energy laser beam;

coding means associated with said replaceable filter for coding each filter such that said control circuit controls the duration and power level of said high energy laser beam automatically with the selection of said filter;

a dielectric mirror disposed at said intersection point to reflect the output of said selected filter and transmit the illumination of said slit lamp to the eye such that said high and low energy beams transmitted through said filter are parfocal with the output of said slit lamp and the illumination of said slit lamp passing through said dielectric mirror;

means for adjusting the position of said dielectric mirror to adjust the focal point of said high energy laser beam within the illuminated area of the eye illuminated by said slit lamp; and

a shutter disposed along the viewing axis of said slit lamp and out of the path of said high energy laser beam;

means for activating said shutter in response to the generation of said high energy laser beam to prevent reflection of the energy from said high energy laser beam from passing along the viewing axis of said slit lamp to the operator; and

filter means disposed along the viewing axis of said slit lamp and out of the transmission path of said high energy laser beam, said filter means selectable to filter out reflections of said high energy laser beam to the operator.

4,520,817

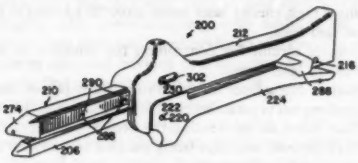
SURGICAL INSTRUMENTS

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 118,664, Feb. 5, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 356,247

Int. Cl.³ A61B *17/04, 17/11*

U.S. Cl. 128—305 **4 Claims**



1. A disposable loading unit for use with a surgical stapler of the type having a first jaw adapted to carry a disposable loading unit, and using a pusher bar to eject staples sequentially from a disposable loading unit carried on the first jaw, and having a second jaw facing the first jaw for closing staples ejected from a disposable loading unit on the first jaw;

said disposable loading unit comprising: a body containing at least one longitudinally extending row of surgical staples and having a first longitudinal passage for receiving a pusher bar; camming means for cooperating with a pusher bar to eject said surgical staples from said body; and a slot extending through the entire thickness of said body for receiving jaw support means for supporting the stapler jaws;

further comprising jaw support means for supporting the stapler jaws, wherein said jaw support means comprises shoe means slidably movable along said slot in tandem with a pusher bar when a pusher bar is received in said first longitudinal passage, said shoe means being adapted to cooperate with a surgical stapler of said type for maintaining the jaws of the surgical stapler substantially stationary relative to each other in the vicinity of said shoe means.

4,520,818

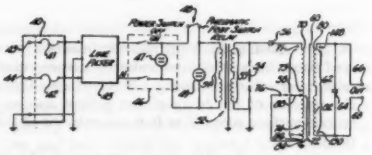
HIGH DIELECTRIC OUTPUT CIRCUIT FOR ELECTROSURGICAL POWER SOURCE

Stanley Mickiewicz, Stoughton, Mass., assignor to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Feb. 28, 1983, Ser. No. 470,642

Int. Cl.³ A61B *17/39;* **H01F** *21/12*

U.S. Cl. 128—303.17 **15 Claims**



1. A transformer circuit comprising

a primary coil including first and second voltage divider segments, each of said segments arranged in phase and having equal inductance;

a plurality of taps connected to said second segment of said primary coil;

switching means for selectably grounding one of said taps for varying the voltage impressed on said second segment;

a secondary coil including first and second voltage divider segments arranged 180° out of phase and having equal inductance;

each of said secondary coil segments being heavily insulated with highly dielectric material;

said primary coil and said second coil being coupled together to provide an output from said secondary coil equal to the sum of the voltages applied to said segments of said secondary coil

whereby said transformer output can be varied by switching from one tap to another of said second segment of said primary coil.

8. An output circuit for a power source for an electrosurgical instrument comprising:

means for providing an alternating current input voltage signal having a predetermined peak voltage;

a primary resonant circuit connected to said input signal means for receiving said alternating current input voltage;

circuit interruption means for introducing a step-function wave form into said primary resonant circuit when said input voltage signal reaches a predetermined level;

a secondary resonant circuit including output terminals and coupled to said primary resonant circuit and resonating at substantially the same frequency as the said primary resonant circuit for delivering a high-frequency, high-voltage output signal to said output terminals for further transmission to an electrosurgical instrument;

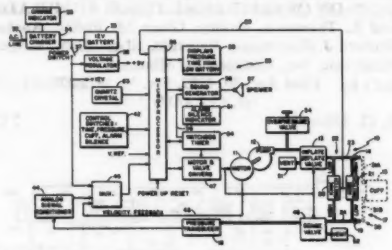
said primary resonant circuit including switching means for adjusting the voltage level at the output terminals of said secondary resonant circuit.

4,520,819

TOURNIQUET WITH DIFFERENTIAL PRESSURE OCCLUSION DETECTOR

Michael J. Birmingham, Denver, and Michael R. Manes, Littleton, both of Colo., assignors to Aspen Laboratories, Inc., Englewood, Colo.

Filed Apr. 15, 1983, Ser. No. 485,346
Int. Cl.[3] A61B *17/12*
U.S. Cl. 128—327 4 Claims



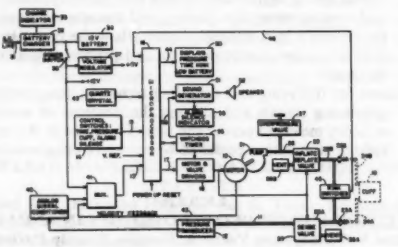
1. A pneumatic tourniquet comprising:
a first means for inflating and deflating a tourniquet cuff, said means having a first port for connection to said cuff;
a second means for sensing the pressure in said cuff, said means having a second port for connection to said cuff;
a pair of pressure differential switches connected anti-parallelly between said first and second means for producing a signal indicative of a pressure differential between said first and second means; and
means responsive to said signal for producing an alarm.

4,520,820

AUTOMATIC TOURNIQUET WITH IMPROVED PRESSURE RESOLUTION

Dwight W. Kitchin, and Michael R. Manes, both of Littleton, Colo., assignors to Aspen Laboratories, Inc., Englewood, Colo.

Filed Apr. 15, 1983, Ser. No. 485,548
Int. Cl.[3] A61B *17/12*
U.S. Cl. 128—327 15 Claims



1. A pneumatic tourniquet comprising:
means for inflating and deflating a cuff;
pressure sensing means for sensing the pressure in said cuff and for producing a plurality of digital signals, each signal representative of said pressure and each signal having a pressure-to-digital signal scale such that the pressures at which the transistions between digital quanta occur are different for each signal; and
display means responsive to said plurality of signals for producing a pressure display having greater resolution than each of said digital signals.

4,520,821

GROWING OF LONG-TERM BIOLOGICAL TISSUE CORRECTION STRUCTURES IN VIVO

Richard A. Schmidt, San Francisco, and Emil A. Tanagho, San Rafael, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 30, 1982, Ser. No. 373,772
Int. Cl.[3] A61B *17/00*
U.S. Cl. 128—334 R 3 Claims

1. A method of growing a long-term biological tissue correction structure in vivo and of thereby surgically correcting a defect in a living body, comprising:
removing biological tissue from the area of the defect;
growing the removed biological tissue in vitro on a mesh formed of a bioabsorable material;
placing the mesh in position to temporarily correct the defect, the mesh, when placed in position to correct the defect, including biological tissue grown thereon in vitro, being of a construction sufficient so that biological tissue in the area of the defect can grow into the mesh and form a long-term biological tissue correction structure before the mesh is completed bioabsorbed and of a size selected to form a hemostatic temporary correction of the defect;
fastening the mesh in position to correct the defect; and
maintaining the mesh in position to correct the defect for a time sufficient for the long-term biological tissue correction structure to form and for the mesh to be completely bioabsorbed.

4,520,822

ETHYLENE-PROPYLENE COPOLYMER SUTURES

Edgar V. Menezes, Somerville, and Peter Steinheuser, Manville, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 432,487, Oct. 4, 1984, abandoned. This application Sep. 13, 1983, Ser. No. 531,246
Int. Cl.[3] A61L *17/00*
U.S. Cl. 128—335.5 7 Claims

1. A sterile surgical monofilament suture comprising an ethylene-propylene copolymer, said copolymer containing a small amount of polymerized ethylene, the balance being polymerized propylene, said ethylene being present in an amount sufficient to impart a significant reduction in Young's Modulus to the suture compared with a comparable polypropylene homopolymer suture, wherein said copolymer contains from about 0.3 to about 7 weight percent polymerized ethylene.

4,520,823

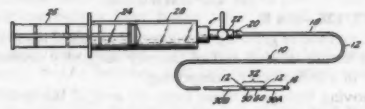
CATHETER WITH SEPARABLE BALLOONS

Harry H. LeVeen, 321 Confederate Cir., Charleston, S.C. 29407; Robert F. LeVeen, 312 Lombard St., Philadelphia, Pa. 19147, and Eric G. LeVeen, 358 Summit Ave., Mount Vernon, N.Y. 10552

Continuation-in-part of Ser. No. 250,603, Apr. 3, 1981, Pat. No. 4,404,971. This application Sep. 19, 1983, Ser. No. 533,755
Int. Cl.[3] A61M *25/00*
U.S. Cl. 128—348.1 4 Claims

1. A catheter which comprises an elongated tube having a central bore extending the length thereof, said bore being closed at one end of said catheter and having means for introducing a pressurized fluid into said bore at the other end of said catheter, said catheter further including first balloon forming structure including expandable wall means disposed about said tube located adjacent the closed end of said catheter, second balloon forming structure including expandable wall means disposed about said tube located along the length thereof spaced from said first balloon forming structure, said wall means being expandable to an inflated position responsive to pressurized fluid in said bore at the location of the associated balloon forming structure, and a separable coupling connected in said tube between said first and second balloon forming structures, said coupling including a first coupling member connected to said tube adjacent said first balloon forming

structure and a second coupling member connected to said tube adjacent said second balloon forming structure, said coupling members having an engaged position and a separated position, and each said coupling member including valve means normally closed in said separated position of said coupling members and operable to open position in said engaged position of said coupling members whereby fluid communication in said bore between said balloon forming structures is open in said engaged position of said coupling members and is closed in said separated position of said coupling members.

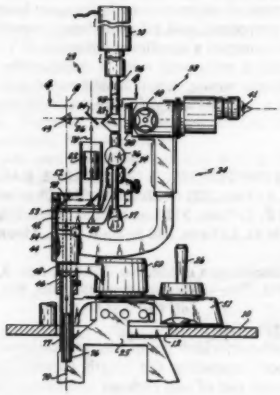


4,520,824

INSTRUMENT FOR OPHTHALMIC LASER SURGERY

James R. Swaniger, Costa Mesa, and Paul R. Goth, Irvine, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Sep. 13, 1982, Ser. No. 417,689
Int. Cl.³ A61N 5/06
U.S. Cl. 128—395 **20 Claims**



1. An instrument for ophthalmic laser surgery, comprising:

(a) a slit lamp adapted to be positioned adjacent a patient's eye, said slit lamp including magnifying means for observing said eye, and said magnifying means being mounted for pivotal movement about an axis;

(b) laser means for producing a beam of laser light;

(c) beam-directing means for directing said laser beam into said eye, said beam impinging upon said beam-directing means along said axis;

(d) means for pivotally mounting said beam-directing means for pivotal movement coaxial with said magnifying means and coupling means for coupling the magnifying means and the beam-directing means for pivotal movement together about said axis; and

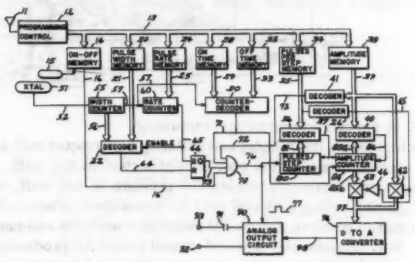
(e) said slit lamp including an illuminator for providing an illumination beam for the patient's eye and means for mounting the illuminator for pivotal movement relative to said beam-directing means and said magnifying means.

4,520,825

DIGITAL CIRCUIT FOR CONTROL OF GRADUAL TURN-ON OF ELECTRICAL TISSUE STIMULATORS

David L. Thompson, Fridley; Glenn M. Roline, Anoka, and Richard J. Harrington, Roseville, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 30, 1982, Ser. No. 373,679
Int. Cl.³ A61N 1/36
U.S. Cl. 128—422 **7 Claims**



1. A remotely programmable circuit for control of gradual turn-on of electrical tissue stimulation comprising:

register means for holding digital signals corresponding to the amplitude of stimulation pulses to be delivered;

pulse generating means responsive to said digital signals for producing electrical tissue stimulation pulses;

means for altering said digital signals in response to successive occurrences of a predetermined number of pulses to cause discrete increases in the amplitude of stimulation pulses from the start of a stimulation interval until a predetermined maximum amplitude is obtained, said means for altering including first memory means for holding digital signals corresponding to said predetermined number, counter means for counting said pulses, and decoding circuit means responsive to said first memory means and said counter means for causing said discrete increases and for resetting said counter means when the count in said counter means corresponds to said predetermined number; and

means for receiving and decoding remotely generated programming signals and altering the contents of said first memory means to permit the rate of increase in the amplitude of stimulation pulses to be remotely programmed.

4,520,826

METHOD FOR GROWTH PROMOTION IN ANIMALS

Viktor V. Sevastyanov; Yakov A. Furman; Anatoly P. Grebenschikov, all of Ioshkar-Ola; Viktor F. Lysov, Kazan, and Boris N. Shalnov, Ioshkar-Ola, all of U.S.S.R., assignors to Mezhkhozyai Stvennoe Opytnokonstruktorskoe Bjuro Mariiskogo Respublicanskogo Proizvodstvennogo Obiedinenia "Mariiskmezhkhozkombikorm" and Mariisky Politekhnichesky Institut, both of Ioshkar-Ola, U.S.S.R.

Filed Sep. 3, 1982, Ser. No. 414,715
Int. Cl.³ A61N 1/06
U.S. Cl. 128—422 **1 Claim**

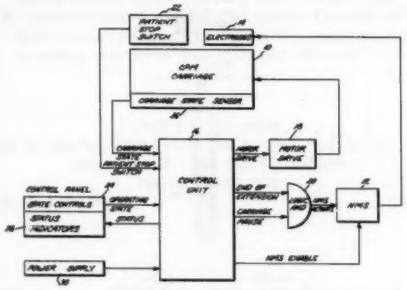
1. A method for growth promotion in animals, consisting in percutaneous application of an electromagnetic field having a frequency of from 25 to 150 MHz and a power of from 30 to 40 W, to the region of the epididymal lobules of the spermatic

cords and the epididymides, said application of an electromagnetic field being carried out until a subcutaneous induration appears in the aforesaid region, that is, within an exposure time of from 10 to 20 s.

4,520,827
NMS AIDED CONTINUOUS PASSIVE MOTION APPARATUS

Thomas C. Wright, New Brighton, and Stephen H. Ober, Chaska, both of Minn., assignors to EMPI, Inc., Fridley, Minn.

Filed Feb. 9, 1984, Ser. No. 578,470
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—423 W **24 Claims**



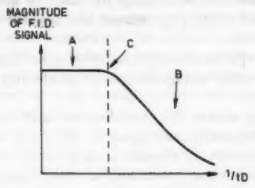
1. Apparatus for moving a leg of a patient, comprising:
continuous passive motion carriage means for supporting the leg through a range of reciprocal angular movement;
drive means for causing reciprocal angular movement of the carriage means between a flexion end position in which an angle of a knee joint of the leg is at a minimum, and an extension end position in the angle is at a maximum;
neuro-muscular stimulation means for applying electrical stimulation to a quadriceps muscle of the leg;
carriage state sensor means for providing a signal representative of a state of the carriage means within the range of reciprocal angular movement; and
control means for controlling the drive means and the neuro-muscular stimulation means to cause the drive means to pause for a predetermined pause interval when the carriage state sensor provides a signal indicating that the carriage means is at the extension end position and enabling the neuro-muscular stimulation means to provide the electrical stimulation to the quadriceps muscle during the pause interval.

4,520,828
NUCLEAR MAGNETIC RESONANCE METHOD AND APPARATUS

Michael Burl, Hampton Hill, and Ian R. Young, Sunbury-on-Thames, both of England, assignors to Picker International, Ltd., Wembley, England

Filed Jul. 28, 1983, Ser. No. 518,215
Claims priority, application United Kingdom, Aug. 11, 1982, 8223115
Int. Cl.³ A61B *5/05*
U.S. Cl. 128—653 **7 Claims**

1. A method of determining the rate of flow of a liquid in a region of a body comprising: sequentially applying a first magnetic pulse effective to cause nuclei preferentially in a slice of said body which includes said region to emit a first free induction decay signal, waiting a period of time less than the spin-lattice relaxation time for said chosen nuclei in said slice and then applying a second magnetic pulse effective to cause nuclei preferentially in said slice to emit a second free induction decay signal and measuring said second free induction decay signal; repeating said sequence for different values of



said period of time; and relating the values of said period of time and the corresponding measured signals to the rate of flow of said liquid through said slice.

4,520,829
METHOD OF TAKING ANGIOGRAPHS

Karl-Heinz Lohse, Im Bans 20a, 2080 Pinneberg, Fed. Rep. of Germany, assignor to Karl-Heinz Lohse, Pinneberg, Fed. Rep. of Germany

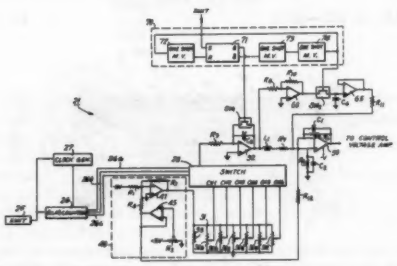
Filed Sep. 30, 1982, Ser. No. 430,496
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3204037
Int. Cl.³ A61B *6/00*
U.S. Cl. 128—654 **7 Claims**

1. Angiographic process utilizing contrast mediums for the roentgenographic representation of living organ vessels, especially human, wherein a reference radiograph is made of a vascular region to be visualized, a contrast medium is infused into said vascular region, a photograph of the same region is produced after a given time interval, for example 0.5 seconds and a visual image is produced by photographic substraction of the two pictures, wherein the process further comprises the steps of reducing the quantity of the contrast medium and the x-ray dose used to produce the pictures by photographically equivalent factors to such an extent that the desired information lies in a density range (blackening range) unsuited to direct observation, and extracting and transposing in the process of photographic subtraction, the density range containing the information into a visual density range suitable for direct observation of the image.

4,520,830
ULTRASONIC IMAGING DEVICE

Eugene L. Flanagan, III, Manhasset, N.Y., assignor to American Home Products Corporation (Del.), New York, N.Y.

Filed Dec. 27 1983, Ser. No. 566,058
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **26 Claims**



1. For examining the interior of an object, an ultrasonic imaging device includes means for producing echo signals

representative of the paths traveled within said object by corresponding ultrasonic waves which are generated by said device, amplifying means for amplifying said echo signals and control means for controlling the level of amplification provided by said amplifying means; said control means comprising:

means for producing a plurality of input signals;

first adjustable voltage means for producing a selected voltage level;

integrating means for operating on said input signals and producing integrated signal levels of a particular polarity;

inverting means for reversing the polarity of said integrated signal levels and producing inverted signal levels; and

summing means for adding said selected voltage of said first adjustable voltage means and said integrated signal levels and responsive to said inverted signal levels for producing control signals said amplifying means amplifying said echo signals in response to said control signals.

4,520,831

PLASTIC HAIRDRESSING COMB

Henning Schumann, Hilden; Peter Busch, Erkrath; Detlef Fischer, Duesseldorf, and Klaus Thiele, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 16, 1984, Ser. No. 590,104

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3309925

Int. Cl.³ A45D *24/00*

U.S. Cl. 132—11 R **9 Claims**

1. A plastic hairdressing comb comprising teeth and a spine consisting essentially of at least one section which negatively charges the hair during combing and at least one section which positively charges the hair during combing, wherein the volume ratio and/or the spatial distribution of the at least one section which negatively charges the hair during combing and the at least one section which positively charges the hair during combing are selected to neutralize the charge produced on the hair by the individual sections in a reciprocal manner.

4,520,832

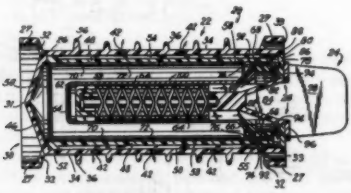
VAPOR GENERATING HAIR ROLLER ASSEMBLY

Jorgen Skovdal, Trumbull, Conn., assignor to Clairol Incorporated, New York, N.Y.

Filed Jan. 28, 1983, Ser. No. 461,811

Int. Cl.³ A45D *2/12*

U.S. Cl. 132—33 R **14 Claims**



1. A vapor generating hair roller assembly comprising:

a hollow roller having a perforated outer surface suitable for winding a tress of hair therearound, said roller having an externally accessible bore with a surrounding heatable surface, said bore being in fluid communication with said perforations; and

liquid providing means removably insertable into said bore for providing liquid at least proximate to said heatable surface so as to generate vapor therefrom, said vapor outletting through said perforation into the tress of hair.

4,520,833

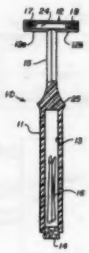
TOOTHPICK HOLDER

Joseph Hadary, 5405 Linden Ct., Bethesda, Md. 20814

Filed Mar. 16, 1983, Ser. No. 476,555

Int. Cl.³ A61C *15/00*

U.S. Cl. 132—90 **5 Claims**



1. A toothpick holder for selectively holding a toothpick in one of a plurality of orientations, comprising:

an elongate handle having a cross-piece at one end;

said cross-piece defining a pair of arms projecting laterally in opposite directions from the handle at substantially a right angle thereto and having free outer ends spaced from the handle; and

each arm having a shaped opening extending transversely therethrough adjacent the free outer end for receiving and holding a toothpick inserted into and through the opening, whereby a toothpick inserted through the opening in one arm has an orientation essentially opposite the orientation of a toothpick inserted through the opening in the other arm, to facilitate access to the interstices between the teeth on opposite sides of the mouth.

4,520,834

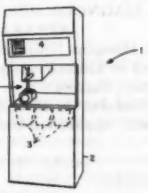
APPARATUS FOR PROCESSING ARTICLES IN A SERIES OF PROCESS SOLUTION CONTAINERS

Paolo S. DiCicco, 395 Laurel St., San Carlos, Calif. 94070

Filed Nov. 8, 1983, Ser. No. 549,990

Int. Cl.³ B08B *3/10*

U.S. Cl. 134—63 **2 Claims**



1. An apparatus in an enclosed housing for the processing of solid materials comprising:

(a) a carrier for containing said solid materials, said carrier affixed to an end of a rotor arm;

(b) a plurality of containers horizontally affixed to a base;

(c) vertical traversing means for raising and lowering said carrier from and into each said container, said vertical

traversing means comprising a first carriage attached to said rotor arm and engaged to moveable vertical shafts;

(d) horizontal traversing means for positioning said rotor arm and carrier above each of said containers, said horizontal traversing means comprising a second carriage moveably engaged to fixed horizontal shafts and to said vertical shafts;

(e) drive means for rotating said rotor arm and carrier in a vertical plane within said housing whereby said carrier and solid materials contained therein are subjected to centrifugal force;

(f) means for moving sequentially said second carriage to a preselected sequence of positions along said horizontal shafts;

(g) means for timing preselected periods during which said carrier remains lowered in each said container; and

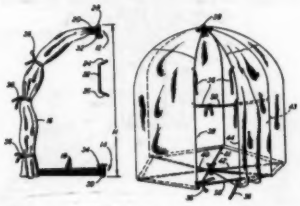
(h) means for timing a preselected period of rotation of said rotor arm at a preselected rotational frequency subsequent to raising said carrier from each said container.

4,520,835

PORTABLE TENT

John D. Moeller, 7854 Vernon Rd. S., Clay, N.Y. 13041

Filed May 25, 1983, Ser. No. 497,999
Int. Cl.³ A45F 1/16
U.S. Cl. 135—102 **6 Claims**



1. A lightweight, portable tent structure movable between erected and folded positions, and between flexed and unflexed positions while in said folded position, said structure comprising, in combination;

(a) a plurality of not less than three substantially identical frame members, each comprising a continuous, solid, metal rod extending from a lower terminal end defining a substantially closed loop, through a linear base portion and a curved upright portion to an upper terminal end defining a substantially closed loop;

(b) said upper terminal ends of each of said frame members being superposed directly upon one another with the openings defined by said closed loops thereof aligned on a first linear axis, and said lower terminal ends being likewise superposed with the openings defined by said closed loops thereof aligned on a second linear axis, said first and second axes being vertically aligned with said first and second terminal ends spaced by a first distance, in the erected position of said tent, and angularly arranged and spaced by a second distance, less than one-quarter of said first distance, in said flexed position;

(c) means for releasably retaining said tent in said flexed position;

(d) first and second headed bolt members extending loosely through said closed loops of said first and second terminal ends, respectively, and each secured by respective nut means to maintain said first and second terminal ends in said directly superposed relation,

said nut means being selectively loosened to permit free movement of said frame members about said first and second axes between said erected position, wherein said frame members are angularly disposed about said first and second axes, and said folded position, wherein said frame members are substantially mutually superposed, and

tightened to frictionally engage said upper and lower, superposed terminal ends between said nut means and the heads of said bolt members to stabilize the positions of said frame members in the erected position;

(e) a flexible fabric covering extending substantially from said upper terminal ends to said base portions of said frame members and secured to said upright portions in angular segments, whereby the size of said segments establishes the angular relation of said frame members in said erected position, said covering having lateral terminal edges respectively secured to a first and a last of said frame member upright portions, and extending 360° about the periphery of said tent when in said erected position with said first and last frame members immediately adjacent one another;

(f) primary securing means for selective attachment between portions of said covering material lateral edges to maintain said first and last frame members in said adjacent position; and

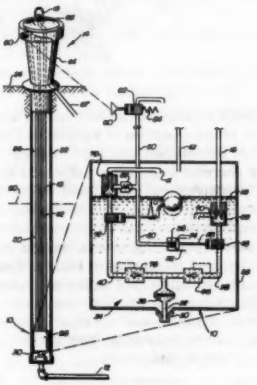
(g) secondary securing means for selective attachment between said first frame member and the next-to-last frame member to maintain a fixed spacing therebetween and prevent movement away from said erected position, whereby said tent may be positionally stabilized by said secondary securing means as said last frame member is moved between positions adjacent said first frame member and adjacent said next-to-last frame member.

4,520,836

FREEZEPROOF VALVE ASSEMBLY

Charles G. Hutter, III, Carson City, Nev., assignor to Physical Systems, Inc., Carson City, Nev.

Filed Aug. 26, 1983, Ser. No. 526,677
Int. Cl.³ E03B 7/12, 9/14
U.S. Cl. 137—59 **25 Claims**



1. A freezeproof valve assembly for controlling water flow from a water supply pipe to a hydrant standpipe, comprising:

a sump housing having a sump chamber for receiving a supply of water;

a primary flow conduit for connection between the water supply pipe and the standpipe;

a refill flow conduit for connection between the water supply pipe and the sump chamber;

a main jet pump along said primary flow conduit and having an induction port communicating with the sump chamber at a position below the surface level of water therein;

a control valve movable between a closed position preventing water flow through said primary flow conduit and an

open position permitting a direct water flow from the supply pipe through said primary flow conduit and further through said main jet pump to draw an induced water flow through said induction port into said main jet pump thereby supplying a combined direct and induced water flow to the standpipe;

refill valve means for controlling water flow from the supply pipe through said refill flow conduit into the sump chamber to maintain the surface level of water within the sump chamber between predetermined upper and lower limits above said main jet pump induction port; and

actuator means for selectively moving said control valve between said open and closed positions, said actuator means including and actuator member movable between first and second positions and a fluid coupling between said actuator member and said control valve for moving said control valve between said open and closed positions in response to actuator member movement respectively between said first and second positions;

said main jet pump induction port providing a flow path for drainage of water within the standpipe into the sump chamber when said control valve is closed.

4,520,837

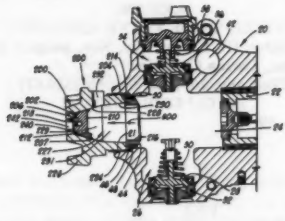
COVER RETAINER

Clinton W. Cole, and Verlin R. Beach, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 31, 1984, Ser. No. 575,634

Int. Cl.³ F16K *13/04*; F04B *39/12*

U.S. Cl. 137—68 R **17 Claims**



1. A cover retainer for a fluid end of a plunger-type pump adapted to retain a portion of a protective cover including first and second disc-shaped portions adapted to separate along a boundary therebetween when subjected to cylinder pressure above a predetermined limit, said cover being provided to relieve pressure in a cylinder of said pump when said pressure exceeds said predetermined limit, comprising:

a receptacle including means on the exterior thereof for securing said receptacle to said fluid end, said receptacle including a cup-shaped cavity of generally frusto-conical configuration therein, the mouth of said cavity being disposed adjacent said cover, and the cross-sectional area of said cavity decreasing from the mouth of said cavity to the bottom of said cavity.

4,520,838

VALVE FOR HIGH PRESSURE FLUID CONTAINER

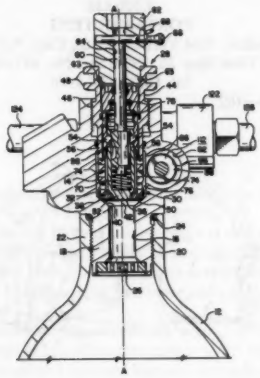
John M. Fisher, Cuyahoga Falls, and James C. Putt, Barberton, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Filed Jul. 1, 1983, Ser. No. 510,001

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—69 **4 Claims**

1. A valve for mounting on a high pressure fluid container comprising a valve housing having a fluid conduit in communication with an inlet passage connected to said fluid container, a cartridge member positioned in said conduit and movable toward and away from said inlet passage, a valve seat in said conduit adjacent said inlet passage, a soft metallic plate member mounted on said cartridge member for seating on said valve seat, pressure means for moving said cartridge toward said inlet passage to crush said plate against said valve seat and close said inlet passage, said pressure means includes a threaded connection between said valve housing and said cartridge, said cartridge having a disc support including a thrust collar member engageable with an outer periphery of said disc for pressing a peripheral edge of said disc against a surface of said valve seat in fluid sealing relationship, said disc support including a central support member positioned adjacent said thrust collar member for supporting a central portion of said disc, latch means connecting said cartridge and said central support member for retaining said central support member in a supporting position, release means for releasing said latch means and permitting movement of said central support member away from said disc so that said central portion of said disc is unsupported and may burst to communicate high pressure fluid from said fluid pressure container to the space within said fluid conduit; resilient rings mounted on said



cartridge in axially spaced relationship at positions spaced from said support member and said latch means in the closed condition for absorbing impact forces when said disc bursts and said high pressure fluid acts against said central support member and said latch means, said valve housing having an outlet passage communicating with openings in said cartridge, said openings in said cartridge communicate directly with said fluid container after bursting of said disc, a regulator chamber in direct communication with said outlet passage, said regulator chamber having an axially movable member to control the flow of fluids therethrough, said movable member having a pair of spaced spools, an outlet opening communicating with said regulator chamber adjacent one of said spools, said one spool operative to regulate the pressure and flow of fluid through said outlet opening by cooperative action with an annular edge of said chamber, the other ones of said spools spaced from said one spool and being greater in surface area than said one spool to facilitate the control of fluid past said one spool to said outlet opening.

4,520,839

VALVE

Robert W. Roff, 15B Jetty Rd., Toora, Victoria, Australia

Filed Apr. 1, 1983, Ser. No. 481,413

Claims priority, application Australia, Apr. 5, 1982, PF3468

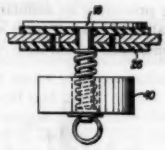
The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.

Int. Cl.³ F16K *17/40*

U.S. Cl. 137—202 **9 Claims**

1. A valve for removing trapped air from a pump line, said valve including an apertured member, a valve member on one

side of said apertured member which covers said aperture(s) for allowing escape of trapped air, biasing means for resiliently biasing said valve member toward its closed position and a



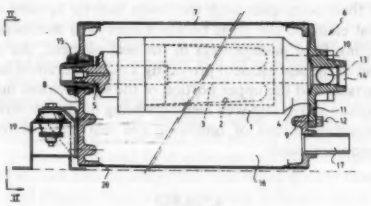
float member on the other side of said apertured member adapted to cover said aperture(s) when said trapped air has been removed or substantially removed.

4,520,840

HYDROPNEUMATIC ENERGY RESERVOIR FOR ACCUMULATING THE BRAKING ENERGY RECOVERED ON A VEHICLE

Robert Michel, Paris, France, assignor to Renault Vehicules Industriels, Lyons, France

Filed Jul. 12, 1983, Ser. No. 513,138
Claims priority, application France, Jul. 16, 1982, 82 12517
Int. Cl.³ F17C *1/00*
U.S. Cl. 137—259 **4 Claims**



1. A combined high pressure-low pressure hydraulic accumulator for a vehicle, said accumulator combining a high pressure hydraulic accumulator located in a casing, and a low pressure hydraulic accumulator comprising the space between said high pressure accumulator and said casing, wherein

said high pressure hydraulic accumulator comprises several bodies, each including a tubular wall, an hydraulic end at an end of said wall with a fitting for hydraulic connection, a pneumatic end at the other end of said wall with a valve and a pneumatic connection for precharging air pressure in said body and checking said pressure, a tie-rod axially located in said body and prestrained between both ends to press said hydraulic end and said pneumatic end toward said wall, and a tubular bladder surrounding said tie-rod and tightly connected to said wall at the vicinity of said pneumatic end and to said tie-rod at the vicinity of said hydraulic end;

said casing comprises a shell with a front end plate at an end thereof and a back end plate at another end thereof, said front end plate being provided with an aperture large enough for freely introducing and extracting all said several high pressure bodies at a time;

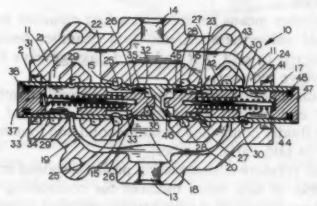
said bodies being all connected, each by said fitting of its hydraulic end, to a single member forming together a manifold for mechanically and hydraulically connecting all said hydraulic ends in parallel to a common high pressure input-output, and a cover for closing said aperture of said casing.

4,520,841

FOUR-WAY VALVE

Glen Brand, and Timmy L. Chew, both of 2332 S. 25th St., Omaha, Nebr. 68105

Filed Dec. 27, 1983, Ser. No. 565,662
Int. Cl.³ F15B *13/04*
U.S. Cl. 137—270 **3 Claims**



1. A four way valve for use in pressure compensated pump systems comprising:

a valve body;

bore means for forming an opening in said valve body;

an inlet port in said valve body in fluid communication with a source of supply of fluid;

an outlet port in said valve body in fluid communication with a fluid supply tank;

a first active port in fluid communication with said opening in the valve body;

a second active port in fluid communication with the opening in said valve body;

a valve member disposed in said opening and selectively movable to first and second active positions and a third neutral position;

a first inlet passage in said valve body leading from said inlet port to said opening in said valve body;

a second inlet passage leading from said inlet port to said opening in said valve body;

a third inlet passage leading from said inlet port to said opening in said valve body;

a first outlet passage in said valve body leading from said opening in said valve body to said outlet port;

a second outlet passage leading from said opening in said valve body to said outlet port;

a third outlet passage leading from said opening in said valve body to said outlet port;

a fourth outlet passage leading from said opening in said valve body to said outlet port;

a first passageway formed in said valve member;

a second passageway formed in said valve member;

a third passageway formed in said valve member;

a fourth passageway formed in said valve member;

said first passageway in said valve member being in fluid communication with said first inlet passage in said valve body and said first active port in said first active position of said valve member, said first passageway in said valve member being in fluid communication with said first active port and with said second outlet passage in said valve body in said second active position of said valve member;

said second passage in said valve member being in fluid communication with said second active port and with said third outlet passage in said valve body in said first active position of said valve member, said second passageway in said valve member being in fluid communication with said first inlet passage in said valve body and said second active port in said second active position of said valve member;

said third passageway in said valve member being in fluid communication with said second inlet passage in said valve body in said first active position of said valve member, said third passageway in said valve member being in fluid communication with said first outlet passage in said

valve body in said second active position of said valve member; and

said fourth passageway in said valve member being in fluid communication with said fourth outlet passage in said valve body in said first active position of said valve member, said fourth passageway in said valve member being in fluid communication with said third inlet passage in said valve body in said second active position of said valve member;

first chamber means for forming a first chamber in one end of said valve member, said first chamber being fluidly connected to said first and third passageways formed in said valve member;

second chamber means for forming a second chamber in the other end of said valve member, said second chamber being fluidly connected to said second and fourth passageways in said valve member;

first fluid pressure compensating means disposed in said first chamber of said valve member for controlling the flow out through said first passageway, said first pressure compensating means, in a meter-out mode being biased to a first position and movable between said first position and a second position, depending upon the relative fluid pressure acting on each end of said first fluid pressure compensating means, the pressure on each end of said first fluid pressure compensating means being the same as the pressure in the inlet port in the first active position of said valve member, said first fluid pressure compensating means tending to be moved from the first position thereof, toward the second position thereof when said valve member is in the second active position thereof, whereby fluid is metered out of said first active port of said valve body, through said first passageway in said valve member, past said first fluid compensating means in said first chamber of said valve member and out the second outlet passage to said outlet port;

second fluid pressure compensating means disposed in said second chamber of said valve member for controlling the flow through said second passageway, said second pressure compensating means being biased to a first position and movable to a second position depending upon the relative fluid pressure acting on each end of said second fluid pressure compensating means, said second fluid pressure compensating means tending to be moved from the first position thereof towards the second position thereof when said valve member is in the first active position thereof, whereby fluid is metered out of said second active port of said valve body, through said second passageway in said valve member, past said second fluid compensating means in said second chamber of said valve member and out the third outlet passage to said outlet port, the pressure on each end of said second fluid pressure compensating means being the same as the pressure in the inlet port in the second active position of said valve member; and

wherein none of said passageways in said valve member are in fluid communication with any of said inlet or outlet passageways in said valve body when said valve member is in the neutral position thereof.

4,520,842

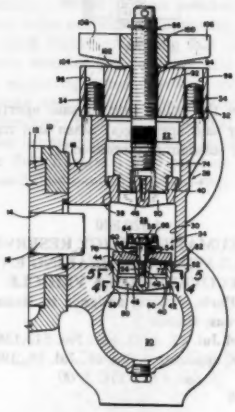
HIGH PRESSURE VALVE FOR POSITIVE PRESSURE PUMPS INCLUDING MEANS FOR INSTALLING AND REMOVING THE VALVE

Robert E. Elliott, 2045 S. Holiday Hills Rd., Midland, Tex. 79703

Filed Nov. 9, 1983, Ser. No. 549,797
Int. Cl.³ F16K *15/02*
U.S. Cl. 137—327 **12 Claims**

1. A high pressure valve seat for a reciprocating pump of the type which has a tapered frustro-conical shaped nonthreaded seat deck comprising:

a tubular seat element having an upper and lower end and having a frusto-conical exterior configuration dimensioned to be received in a pump tapered seat deck, the seat element having a centrally and coaxially positioned stem retainer portion (having an internally threaded recess in the upper end), the exterior dimension of the stem retainer portion being less than that of the tubular seat element interior diameter providing an annular flow passageway, including a plurality of spaced apart web members connected at their inner ends to said stem retainer portion and



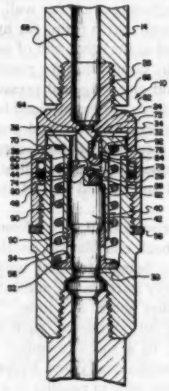
at their outer ends with the lower interior portion of the seat element, the areas between such web members providing fluid passageways in the seat element, the upper end of the seat element providing a circumferential sealing surface, and the upper portion of the seat element interior surface above said web members being internally threaded providing means of removing the seat element from a pump seat deck.

4,520,843

FLOW CONTROL VALVE

Paul E. Debrunner, Jr., Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 27, 1984, Ser. No. 583,561
Int. Cl.³ F16K *17/20*
U.S. Cl. 137—469 **6 Claims**



1. A flow control valve for holding a column of fluid until

the pressure of said fluid reaches a preseleted cracking pressure, said control valve comprising:

a valve body having an internal chamber, an inlet at one end of said chamber for receiving said column of fluid and an outlet at the opposite end of said chamber for discharging said fluid from said valve;

a poppet axially movable within said internal chamber between an inlet-closing position and a retracted position, said poppet comprising a piston head having a face opposing said inlet and a plug projecting from said face, said plug closing-off said inlet from the remainder of said face when said poppet is at said inlet-closing position, said face being exposed to said fluid from said inlet when said poppet is moved from said inlet-closing position, said poppet further comprising at least one passage through said piston head for conveying said fluid from said face to a location on the backside of said piston head, an axially reciprocable, hollow connector extending from said backside and defining an interior channel in said poppet extending toward said other end of said valve body, said connector internally conveying fluid from said backside location to said oulet, and an annular hollow stem extending inward from said other end of said valve body slidably engaging the end of said connector to form a continuation of the interior channel defined by the connector;

an annular stop at a fixed location within said chamber for peripherally engaging said backside of said piston head when said poppet is at said retracted position to thereby prevent further axial movement of said poppet and to form at least a partial seal about the periphery of said piston head, said piston-head passage providing enough pressure drop in the fluid conveyed therethrough to assure that the poppet remains in its retracted position;

at least one hole in the wall of said stem for connecting the lower-pressure, other end of the valve body to a cavity between the backside of the piston head, the valve body and the hollow connector and for evacuating fluid leaking about the periphery of said piston head and

biasing means for urging said poppet towards said inlet-closing position, said biasing means providing sufficient urging force to maintain said poppet at said inlet-closing position until said fluid achieves said cracking pressure,

the surface area of said piston head being greater than that of said plug so that, when said plug is forced out of sealing contact with said inlet, said fluid pressure against said piston head exerts a substantially greater force on said piston head than the opposite force exerted thereon by said biasing means, thereby causing said poppet to snap into its retracted, fully open position.

4,520,844

REGULATOR VALVE FOR STABILIZING VOLUME FLOW, ESPECIALLY IN VENTILATION SYSTEMS

Wolfgang Finkelstein, and Josef Haaz, both of Neukirchen-Vluyn, Fed. Rep. of Germany, assignors to Gebruder Trox, GmbH, Neukirchen-Vluyn, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 477,752

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 8229509[U]

Int. Cl.³ F24F *13/08*

U.S. Cl. 137—486 **20 Claims**

1. A regulator valve, comprising:

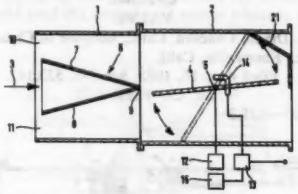
(a) a flow conduit with an upstream end and a downstream end;

(b) an adjustment flap pivotally mounted in said conduit and associated with said downstream end for adjusting the flow of fluid through said conduit;

(c) flow measuring means disposed at least in part in said conduit for monitoring the flow rate of fluid flowing through said conduit;

(d) means operably associated with said adjustment flap and with said flow measuring means for causing pivoting of said adjustment flap; and,

(e) at least two turbulence grates disposed in said conduit and associated with said upstream end and each of said grates has a first end and a second end and said second ends being spaced apart and said first ends being joined



together downstream of said second ends so that said grates are angularly disposed and said second ends are spaced from the periphery of said conduit whereby fluid flowing through said conduit is stabilized.

4,520,845

HYDRAULIC DISTRIBUTORS

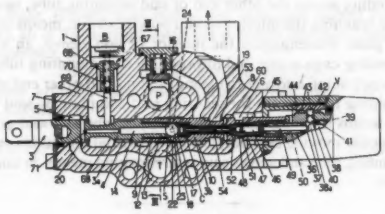
Olivier Isaac, and Louis Pignolet, both of Lyons, France, assignors to Rexroth-Sigma, Venis Sieux, France

Filed Dec. 1, 1982, Ser. No. 445,922

Claims priority, application France, Dec. 3, 1981, 81 22670

Int. Cl.³ F15B *13/01*

U.S. Cl. 137—624.27 **8 Claims**



1. A hydraulic distributor comprising:

a body provided at least with one pressurised fluid inlet port, one return port for returning the fluid to a tank, two connecting ports connecting with a hydraulic apparatus or component, and a slide valve adapted to slide in a bore of the distributor body;

the body and the slide valve including passages, channels and/or grooves arranged so as to cooperate to establish the desired connection or closure of the various ports of the distributor body, according to the position occupied by the slide valve;

this distributor comprising locking means for the slide valve in its working and resting positions, the locking means actuated mechanically on the movement of the slide valve;

wherein, on the one hand, the slide valve is constructed of at least two parts assembled to one another and a pressure selector is arranged inside the slide valve, this pressure selector comprising two inlets and one outlet, and adapted to compare the two pressures on these inlets and to supply, at its outlet, the highest pressure; coupling means being provided in the distributor body and in the slide valve to couple the two inlets of the selector respectively to the two connecting ports of the distributor, and to connect the outlet of the selector to a channel opening outside the distributor body;

and wherein, on the other hand, the distributor includes means sensitive to the outlet pressure of the selector adapted to control the actuation of the unlocking means

when the outlet pressure of the selector passes through a predetermined limit.

4,520,846

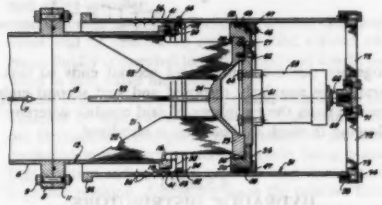
VALVE

Robert W. Dixon, Concord, Calif., assignor to Chas. M. Bailey Co., Inc., Emeryville, Calif.

Filed Aug. 15, 1983, Ser. No. 523,142

Int. Cl.³ F16K *3/26*

U.S. Cl. 137—625.3 **1 Claim**



1. A valve comprising a mounting tube concentric with an axis, means for supplying one end of said tube with liquid under pressure, a polyjet sleeve having apertures therethrough externally exposed to the atmosphere to discharge said liquid directly to the atmosphere and surrounding and coaxial with said mounting tube, a solid end plate axially spaced from and extending across the other end of said mounting tube, said end plate spanning the interior of said polyjet sleeve, means on said end plate interengaging the interior of said sleeve, an axially extending cage at one end disposed on said mounting tube and disposed along said axis to extend beyond said other end of said mounting tube, means for securing said end plate on said cage, and means interengaging said mounting tube and said polyjet sleeve for moving said polyjet sleeve in axial directions on said mounting tube and across said interengaging means on said end plate.

4,520,847

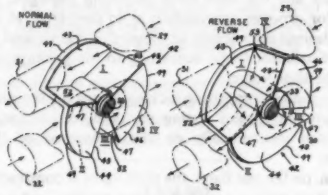
FLUID FLOW DIVERTER DISC VALVE

Walter J. Baron, Milwaukee, Wis., assignor to Water Services of America, Inc., Milwaukee, Wis.

Filed Aug. 30, 1983, Ser. No. 527,691

Int. Cl.³ F16K *11/083, 5/02*

U.S. Cl. 137—625.43 **7 Claims**



1. A fluid flow reversing diverter valve (1) for connection between a source of pressurized fluid (15) and a process device (2), comprising, in combination:

(a) an enclosed housing (21) having a longitudinally extending generally cylindrical side wall (22) and end walls (23, 24),

(b) a pair of spaced parallel upstream supply and return ports (29, 30) disposed in said housing side wall for connection to the fluid source,

(c) a pair of spaced parallel downstream output and input ports (31, 32) disposed in said housing for connection to the process device, said downstream ports being in line with said upstream ports,

(d) and a valve rotator assembly (42) disposed within said housing for rotation between a first and second position about a longitudinal axis (34) so that fluid entering said supply port (29) may be selectively directed to either of said downstream ports and so that fluid returning through either of said downstream ports is discharged through said return port (30), said assembly being connected to means to rotate the assembly within said housing and including:

(1) axle means (33) mounted for rotation on said axis and fixed against axial movement,

(2) a plurality of disc segments (43–46) disposed transversely of said axle means and extending radially outwardly therefrom, and with said disc segments having a pair of arcuately spaced generally radial edges (47, 48) and terminating in arcuate edges (49) disposed closely adjacent said housing side wall, said disc segments being disposed alternately adjacent opposite end portions of said axle means to form two pair (43, 45–44, 46) of arcuately spaced disc segments,

(3) and longitudinally extending partitions (52, 53) joining said radial edges of alternate disc segments,

(e) said assembly forming a plurality of rotatable alternating arcuate diverter chambers (I–IV) delineated by said housing side wall, said disc segments, and said partitions, and with the ends of said chambers opposite said disc segments being open.

4,520,848

RAPIER OR GRIPPER WEAVING MACHINE

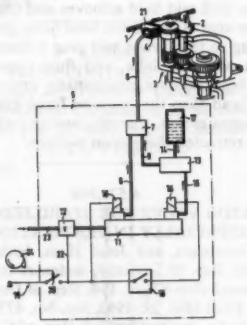
Anton Lucian, and Kurt Geiger, both of Arbon, Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Mar. 6, 1984, Ser. No. 586,829

Claims priority, application Switzerland, Mar. 23, 1983, 1575/83

Int. Cl.³ D03J *1/00*

U.S. Cl. 139—1 R **5 Claims**



1. A rapier weaving machine having a rapier, comprising:

a drive element for imparting to-and-fro motion to the rapier of the rapier weaving machine;

an oil lubrication device having a spray nozzle opening in proximity to said drive element;

a pressurized conduit with which there is operatively connected said spray nozzle;

said oil lubrication device comprising a mixing chamber having an outlet;

said pressurized conduit being connected to said outlet of said mixing chamber;

said oil lubrication device further comprising;

means for continuously transmitting a flow of pressurized air through said mixing chamber;

an oil reservoir for supplying predetermined quantities of

oil to said mixing chamber for admixture with said continuously transmitted flow of pressurized air through the mixing chamber;

an oil dosing and injecting device arranged upstream of the mixing chamber and operatively connected with said mixing chamber;

a timer provided for the periodical operation of said oil dosing and injecting device to periodically admix a predetermined volume of oil with the continuous flow of pressurized air supplied to the spray nozzle; and

said spray nozzle being a molecular atomizing nozzle.

4,520,849

METHOD FOR DISPOSAL OF DEFECTIVE WEFT YARN IN A FLUID JET LOOM

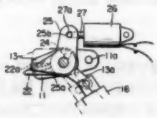
Hajime Suzuki, Anjo, and Yoshimi Iwano, Ohbu, both of Japan, assignors to Seisakusho Kabushiki Kaisha Toyoda Jidoshokki, Kariya, Japan

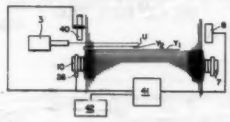
Filed Dec. 7, 1982, Ser. No. 447,511

Claims priority, application Japan, Dec. 11, 1981, 56-200600

Int. Cl.³ D03D *49/50*

U.S. Cl. 139—116 **5 Claims**





1. A method for disposal of a defective weft yarn in a fluid jet loom, wherein the weft yarn whose length has been measured is inserted by a fluid jet from a weft yarn inserting nozzle into successively formed sheds defined by alternating upper and lower warp yarns and the inserted weft yarn is normally cut by a weft yarn cutter, characterized by the steps of temporarily disabling the weft yarn cutting function by deflecting the weft yarn from the weft yarn cutting point in said weft yarn cutter substantially instantaneously upon detection of a defective yarn insertion and while continuing to insert said weft yarn into the succeeding shed, and subsequently stopping the loom operation whereby the uncut weft yarn contiguous to the defective yarn includes a U-shaped portion and extends to said nozzle.

4,520,850

APPARATUS IN A SHUTTLELESS WEAVING MACHINE FOR MAKING A SELVAGE

Gottfried Cramer, Lindau, and Valentin Krumm, Hergensweiler, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

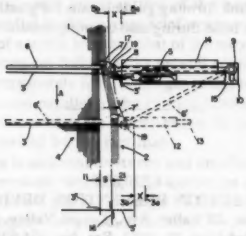
Filed Oct. 4, 1983, Ser. No. 538,905

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1982, 3240569

Int. Cl.³ D03D *41/00*

U.S. Cl. 139—194 **8 Claims**

1. In an apparatus in a shuttleless weaving machine for forming in a fabric, a selvage with projecting filling yarns, where the ends of said filling yarns inserted into a shed by a filling yarn insertion device, are laid into a fastener means mounted at a lateral spacing from warp threads of the fabric, said fastener means holding said filling yarns and where subsequently the filling yarns are beaten against the fabric by a reed performing a beat-up motion, the improvement comprising first means coupling said fastener means (2) to said beat-up motion of said reed (6), and second means whereby at beat-up



(A) of said filling yarn (3) said fastener means are additionally displaceable along a displacement path in a lateral direction (V) from a rest position tightly against said reed (6), whereby a spacing (S) is formed between the fabric (4) and the fastener means (2).

4,520,851

GRIPPER FOR INSERTING THE WEFT IN A RAPIER WEAVING MACHINE

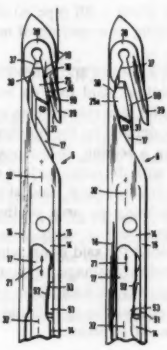
Willy Rohr, Hinwil; Kurt Wollgarten, Rüti, and Rudolf Vogel, Grüt, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 2, 1984, Ser. No. 595,722

Claims priority, application European Pat. Off., Apr. 18, 1983, 83810160.8

Int. Cl.³ D03D *47/20*

U.S. Cl. 139—448 **7 Claims**



1. A gripper for weft thread insertion in a rapier weaving machine and having a longitudinal direction, comprising:

a gripper frame;

a clamping hook for engaging a weft thread;

a clamping tongue operatively associated with said clamping hook and having an opening motion;

spring means acting upon said clamping tongue;

said clamping tongue being translatable in said gripper frame in said longitudinal direction of the gripper under the action of said spring means;

said clamping tongue having a clamping tongue head;

said clamping hook having a major flank and a minor flank;

said major flank of the clamping hook and said clamping tongue head of the clamping tongue being both oriented at

a first inclination to the longitudinal direction of the gripper;

said minor flank of the clamping hook being oriented at a second inclination to the longitudinal direction of the gripper which is of opposite sense to said first inclination; and

said minor flank forming guide means for guiding the clamping tongue head during said opening motion of the clamping tongue.

4,520,852

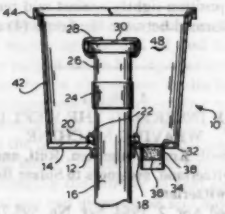
POLLUTION PREVENTION DEVICE

William T. Klein, 33 Valley Ave., Locust Valley, N.Y. 11560

Filed Mar. 21, 1983, Ser. No. 476,935

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—86 **7 Claims**



1. A pollution prevention device for use in association with a fill pipe for filling a storage tank and the like, said device comprising:

a basin positioned about a fill pipe so as to contain liquid spilled during filling or emptying of material through the fill pipe;

said basin includes a bottom and sidewall upwardly extending from the bottom, said bottom includes an opening through which a fill pipe extends upwardly and passes into an area partially defined by the bottom and sidewall, said opening includes a sealing means positioned thereabout and engageable with the outer surface of the fill pipe so as to form a seal therebetween, said sidewall, bottom and outer surface defining an area of the basin capable of holding spilt liquid; and

outlet means provided for said basin which includes means capable of allowing drainage of water from the basin while preventing the spilt liquid from passing through said means so as to collect the spilt liquid in the basin while allowing the run-off of water.

4,520,853

DRUM POSITIONING SYSTEM

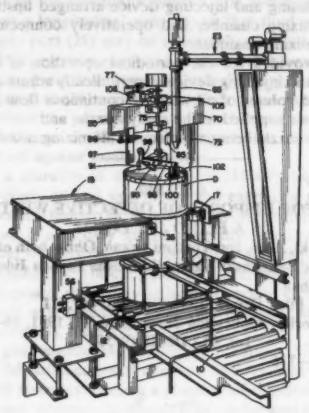
Leo J. Niese, and Gary R. Sharlow, both of Toledo, Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Feb. 6, 1984, Ser. No. 577,333

Int. Cl.³ B65B *35/56*

U.S. Cl. 141—168 **15 Claims**

1. A method for positioning a filler opening of a drum into alignment with a filler comprising the steps of placing a probe in contact with a surface of the drum having a filler opening, moving the probe with respect to the drum surface in a path intersecting the filler opening until the probe engages the filler opening, moving the engaged probe toward the position of the



filler, determining alignment of the filler with the filler opening, and withdrawing the probe from the filler opening.

4,520,854

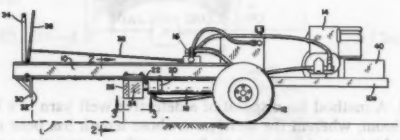
LOG SPLITTER

Jim May, 12110 SE. Pine, Portland, Oreg. 97216

Filed Nov. 28, 1983, Ser. No. 555,496

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 A **5 Claims**



4. A log splitter comprising

a longitudinal frame having opposite ends,

wheel means supporting said frame on a supporting surface,

an abutment secured adjacent one end of said frame,

a powered ram on said frame arranged to move toward and away from said abutment,

one of said abutment and ram having a wedge-shaped portion for splitting a log disposed between said abutment and ram,

said abutment and ram being positioned on said frame such that said splitter is capable of splitting a log lying on a supporting surface,

said frame extending longitudinally on both sides of said wheel means,

and counterbalance means adjacent the opposite end of said frame from said abutment whereby to provide easy maneuverability of said splitter.

4,520,855

GOLF CLUB COVER

Sam Dien, 156 Rockwood Pl., Englewood, N.J. 07631

Filed Dec. 27, 1983, Ser. No. 565,457

Int. Cl.³ A63B *57/00*

U.S. Cl. 150—52 G **4 Claims**

1. A golf club cover arrangement comprising at least two golf club covers, each of said golf club covers including a body portion shaped and adapted to fit over the head of a golf club,

a first and a second attachment member secured to said body portion, first and second mating fastening means respectively secured to said first and second attachment members, whereby one of said fastening means on one of said said first and second attachment members on one golf club cover removed from a golf club can be detachably secured to the mating fastening

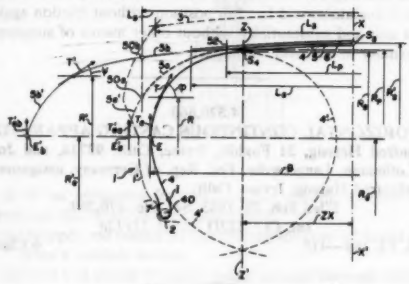
means on the other of said first and second attachment members of another golf club cover, and one or more caps provided on said second attachment member and positioned in proximity to said second fastening means, the number of said caps being less by one the identifying number of the golf club over which the cover is adapted to be placed when the club is not in use.

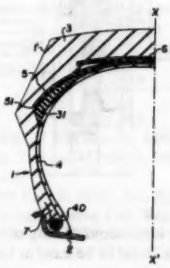
4,520,856

RADIAL TIRE FOR HEAVY LOADS

Jean Pommier, deceased, late of Clermont-Ferrand, France (by Alain Gaston Pommier, heir), assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation-in-part of Ser. No. 363,414, Mar. 30, 1982, abandoned. This application Feb. 17, 1984, Ser. No. 581,236
Claims priority, application France, Apr. 3, 1981, 81 06908
Int. Cl.³ B60C *3/00, 9/08, 9/20*
U.S. Cl. 152—454 **13 Claims**





1. A tire for heavy and very heavy carrier vehicles, possibly traveling off the road, having a carcass reinforcement formed of at least one ply of radial cables anchored to at least one bead ring in each bead and a tread reinforcement comprising essentially two superimposed plies, known as working plies, formed of cables of low extensibility which are parallel in each ply and crossed from one ply to the other, forming acute angles with the circumferential direction of the tire, these plies being, on the one hand, of different axial widths so that the axially narrowest ply has a width less than that of the tread and, on the other hand, parallel to the carcass reinforcement along a zone of parallelism of a width less than that of the narrowest ply, the carcass reinforcement following its natural equilibrium meridian profile approximately from the edges of the zone where the two tread plies are parallel to the carcass reinforcement up to at least the points where the latter reaches its maximum axial width, characterized by the fact that:

when the tire is mounted on its rim and uninflated, the cables of the narrowest working ply, known as an active ply, form, as known per se, an angle of between 15° and 35° with the equatorial plane of the tire;

the other working ply, known as an additional ply, has an axial width between 1.05 times the axial width of the tread and 1.1 times the maximum axial width of the carcass reinforcement;

the cables of the additional ply form with the equatorial plane of the tire an angle α_o greater than and of opposite direction to that of the cables of the active ply and being between 25° and 65°;

the cables of the additional ply follow a geodesic path from one edge to the other of said ply;

the meridian profile of the additional ply is defined by the relationship

$$\cos \psi = \frac{R'^2 - R'^2_{\varepsilon 2}}{R'^2_{s2} - R'^2_{\varepsilon 2}} \cdot \frac{R' \sin \alpha_o}{\sqrt{R'^2 - R'^2_{s2} \cos^2 \alpha_o}}$$

the meridian curvature $1/\rho_o$ of the additional ply, at the place where it intersects the equatorial plane, is defined by the relationship

$$\frac{1}{\rho_o} = \frac{2\,R'_s}{R'^2_{s2} - R'^2_{\varepsilon 2}} - \frac{ctg^2\,\alpha_o}{R'_s}$$

ψ designates the angle which is formed by the tangent to the trace of the additional ply at the running point of radius R' with a line parallel to the axis of rotation of the tire; R'_ε is between 0.8 and 1.2 times the radius of the point of the carcass reinforcement where the latter reaches its maximum axial width; R'_s is the radius of the point where ψ is equal to zero; the radii R', R'_ε and R'_s are measured from the axis of rotation of the tire;

and the trace of the natural equilibrium meridian profile of the carcass reinforcement follows tangentially the curvature of the zone of parallelism from the edge of the zone of parallelism.

4,520,857

HIGH-DURABLE PNEUMATIC RADIAL TIRES

Takao Ogino, Tokorozawa; Yoichi Watanabe, Higashimurayama, and Shigehisa Sano, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 549,533
Claims priority, application Japan, Nov. 9, 1982, 57-195332
Int. Cl.³ B60C *9/02, 9/18*
U.S. Cl. 152—527 **2 Claims**

1. In a high-durable pneumatic radial tire comprising a tread portion, a pair of side portions extending from said tread portion, a pair of bead portions extending from said side portions and a carcass reinforced with a belt embedded in said tread portion, the improvement wherein steel cords each obtained

by twisting plural steel filaments with a pearlite structure having an average value of interlamellar distance between

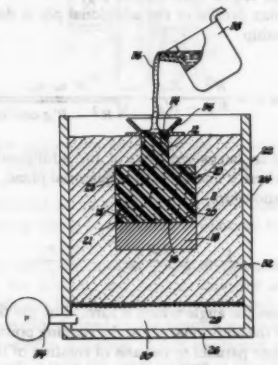
cementites of 300–500 Å and a tensile strength of not less than 220 kg/mm^2 are used in at least one of said belt and carcass.

4,520,858

CHILL-ENHANCED LOST FOAM CASTING PROCESS

Edward F. Ryntz, Jr., Warren, and John J. Bommarito, Washington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 2, 1983, Ser. No. 547,839
Int. Cl.^{3} B22C *9/04*; B22D *15/00*
U.S. Cl. 164—34 3 Claims



1. A lost foam casting process for producing a metal casting having a region characterized by substantially reduced porosity and comprising

adhesively bonding a vaporizable pattern to a chill member using a vaporizable adhesive agent, said chill member being characterized by a relatively high thermal diffusivity,

embedding the bonded assembly of the chill member and the pattern within a mold formed of unbonded refractory particles,

pouring molten metal into the mold to vaporize and replace the pattern including a region immediately adjacent the chill member, whereupon the adhesive agent is also vaporized,

cooling and solidifying the metal within the mold to form a product casting, said chill member accelerating cooling of metal in the region thereadjacent to preferentially solidify the metal, and

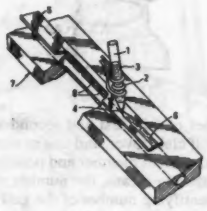
removing the product casting from the mold and separating the product casting from the chill member, whereupon the metal within the region cast adjacent the chill member exhibits reduced porosity as a result of said chill-enhanced solidification.

4,520,859

APPARATUS FOR RAPID SOLIDIFICATION OF THIN METALLIC STRIPS ON A CONTINUOUSLY MOVING SUBSTRATE

Pascal Fournier, Paris, and Jean-Claude Peraud, Mandres Les Roses, both of France, assignors to Pont-A-Mousson, S.A., Nancy, France

Filed Jul. 17, 1981, Ser. No. 284,346
Claims priority, application France, Jul. 18, 1980, 80 15918
Int. Cl.^{3} B22D *11/06, 27/15*
U.S. Cl. 164—253 19 Claims



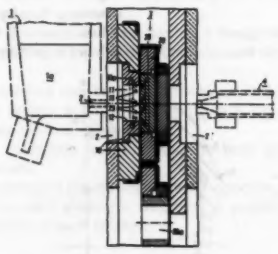
1. An apparatus for rapidly solidifying a metal or alloy on its formation into a thin strip comprising a band moving at high speed, a means for ejection under pressure of a metal or alloy in molten state, situated above the high speed band, said band having a zone of impact in which said molten metal or alloy impacts on said band after said ejection, at least one perforated unit containing at least one opening for the ejection of a pressurized gaseous fluid at low temperature opposite at least one of the faces of said band and in proximity to said zone of impact of the molten metal or alloy on said band, said ejected gaseous fluid creating between said unit and said band a fluid cushion which maintains said band in position without friction against said unit and substantially without other means of support in proximity to said zone of impact.

4,520,860

HORIZONTAL CONTINUOUS CASTING APPARATUS

Manfred Haissig, 31 Foxhill, Irvine, Calif. 92714, and Josef Lothmann, Langerwehe, Fed. Rep. of Germany, assignors to Manfred Haissig, Irvine, Calif.

Filed Feb. 28, 1983, Ser. No. 470,269
Int. Cl.^{3} B22D *23/00, 11/128*
U.S. Cl. 164—415 6 Claims



1. Apparatus for the continuous casting of metals comprising a container for molten metal to be cast, at least one discharge duct at the bottom of said container connecting with a horizontal continuous casting mold and a closure assembly in said duct, characterized in that said closure assembly comprises

a substantially vertically disposed headplate fixed at one side thereof to said discharge duct facing said molten metal

container, said headplate having a horizontally oriented bore therethrough aligned with said duct, said

a substantially vertically disposed slider plate adapted to be moved across the other side of said headplate to block flow of molten metal through said bore to said mold,

said slider plate having a plurality of nozzle openings in the surface of said slider plate facing said bore, said nozzle openings being disposed along a circular path adjacent to but smaller than the diameter of said bore, said nozzle openings being arranged to direct a gaseous medium at an angle of between 3 degrees to 45 degrees to said surface and substantially tangentially to said circular path.

4,520,861

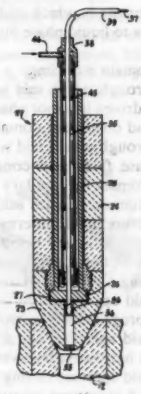
METHOD AND APPARATUS FOR ALLOYING CONTINUOUSLY CAST STEEL PRODUCTS

Robert Sobolewski, Streetsboro, and David N. Eberle, North Canton, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Nov. 18, 1983, Ser. No. 553,163

Int. Cl.³ B22D *11/10*

U.S. Cl. 164—473 **6 Claims**



1. In an apparatus for continuously casting alloyed steel products, the improvement comprising:

(a) stopper rod means for controlling the flow of liquid steel from a tundish nozzle;

(b) said rod means having a guide passage through which a alloying wire can be fed, a cooling passage adjacent said guide passage, and a hole in one end forming an enlarged extension of said guide passage;

(c) heat meltable plug means for temporarily closing said hole; and

(d) meltable closure means for temporarily closing said guide passage.

4,520,862

ENERGY STORAGE APPARATUS

Walter Helmbold, Vor der Hurth 31, 5902 Unglinghausen, Fed. Rep. of Germany

Filed Feb. 8, 1983, Ser. No. 465,068

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204849; Mar. 20, 1982, 3210370

Int. Cl.³ F28D *17/02*

U.S. Cl. 165—10 **16 Claims**

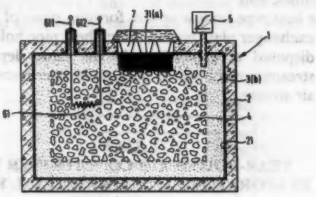
1. Storage apparatus for storage of energy in the form of heat over a selectably prolonged storage period, said apparatus comprising:

(a) container means forming an external enclosure for a heat storage zone and for an insulating zone which surrounds said storage zone and is in pressure communication therewith;

(b) a porous mass of heatable storage material disposed in said storage zone within said container means to form a storage core for storage of heat energy;

(c) means for subjecting said storage material in said storage zone to a heating process thereby to effect storage of heat energy in said storage core;

(d) means for extraction of said stored heat energy from said storage core;



(e) a thermal insulating layer disposed in said insulating zone between said storage core and inner wall means of said container means, said insulating layer comprising an insulating porous mass of granular or fibrous material; and

(f) means for inducing in said storage zone and in said insulating zone within said container means a pressure below atmospheric pressure thereby to inhibit conduction of said stored heat energy from said storage core in direction through said insulating layer to said container means.

4,520,863

HEAT-EXCHANGER WITH A BUNDLE OF PARALLELLY EXTENDING PIPES ADAPTED TO BE ACTED UPON BY AIR

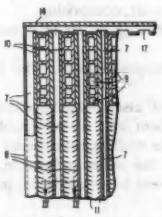
Rudolf Andres; Helmut Grantz, both of Sindelfingen; Wolf-Dietrich Münzel, Ehningen, and Wolfgang Odebrecht, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 27, 1982, Ser. No. 436,937

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1981, 3143334

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—48 R **17 Claims**



1. A heat-exchanger with a bundle of pipe means extending substantially parallelly and arranged in at least one row, said bundle of pipe means being hermetically closed and being constructed in the manner of heat-pipe means forming heat-pipe hollow spaces, and at least one heat-exchanger head means adapted to be traversed by a heat carrier medium and extending transversely to the bundle of pipe means, said heat-exchanger head means being sealed off with respect to the heat-pipe hollow spaces of the bundle of pipe means and in heat-transferring connection therewith;

said bundle of pipe means and heat pipe hollow spaces of a pipe row being in the form of a first heat-exchanger plate means extending in an air stream and up to the area of the heat-exchanger head means, the pipes of said bundle of

pipe means being formed by channel means formed in the heat-exchanger plate means;

the first heat-exchanger plate means being arranged substantially parallel to the air stream;

a second heat-exchanger plate means containing heat-carrier channel means and limited to the heat-exchanger head means being coordinated to each first heat-exchanger plate means, adjacent first and second heat-exchanger plate means being heat-conductingly connected to each other; and

the heat pipe hollow spaces forming pipes of different heat-exchanger plate means, which heat pipe hollow spaces are disposed at approximately the same depth in the air stream, are connected with each other transversely to the air stream.

4,520,864

YEAR-ROUND AIR CONDITIONER WITH EVAPORATOR BAND AND SPECIAL HEATER PLACEMENT

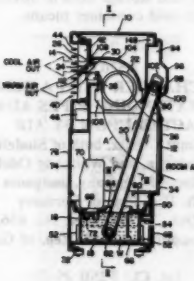
Nobuhiko Katsgiri, Maebashi; Hidenobu Matsubara, Shibukawa, and Akio Iida, Maebashi, all of Japan, assignors to Toshiba Electric Appliances Co., Ltd., Maebashi, Japan

Filed May 27, 1983, Ser. No. 498,653

Claims priority, application Japan, May 29, 1982, 57-91881

Int. Cl.³ F24F *3/14*

U.S. Cl. 165—60 **8 Claims**



1. A year-round air conditioner capable of selective supply of cool and warm air, comprising:

(a) a housing having an air inlet and an air outlet defined therein;

(b) a water receptacle within the housing for containing water;

(c) a wet band assembly comprising an endless band of water-absorbent and air-permeable material capable of traveling, the endless band being arranged to be partly immersed in the water receptacle, thereby to be wetted, and to intervene between the air inlet and the air outlet in the housing;

(d) a fan within the housing for creating airflow from the air inlet to the air outlet through the endless band of the wet band assembly;

(e) a damper disposed at the air outlet in the housing and dividing the air outlet into a cool air outlet and a warm air outlet, the damper being pivotable about an axis between a first position where the cool air outlet is opened with the warm air outlet being closed and a second position where the warm air outlet is opened with the cool air outlet being closed, the damper extending obliquely across an air passage so as to change the direction of an air flow in the passage; and

(f) a heater mounted on the surface of the damper and arranged to face the cool air when the damper is in the second position, and further arranged to be outside the air flow when the damper is in the first position.

4,520,865

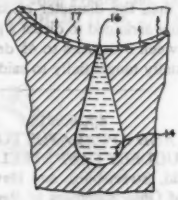
GAS-TOLERANT ARTERIAL HEAT PIPE

Gary D. Bizzell, Los Altos, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jun. 25, 1984, Ser. No. 624,198

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—104.26 **19 Claims**



1. A closed-loop arterial heat pipe comprising:

(a) an evaporator domain having an internal surface defining an evaporation chamber in which a working fluid in liquid phase evaporates to vapor phase by absorbing heat from a heat source;

(b) a condenser domain in which said working fluid in vapor phase condenses to liquid phase by rejecting heat to a heat sink; and

(c) a transition domain including:

(i) a conduit through which said working fluid is thermodynamically driven in vapor phase from said evaporator domain to said condenser domain, and

(ii) an artery through which said working fluid is returned in liquid phase from said condenser domain to said evaporator domain by capillary action,

said artery communicating with said evaporation chamber through an aperture in said internal surface of said evaporation chamber; said artery being of generally pyriform transverse cross-sectional configuration, a wide portion of said artery having a relatively large transverse dimension remote from said aperture, intermediate portions of said artery having progressively narrower transverse dimensions toward said aperture, and a throat portion of said artery having a narrowest transverse dimension adjacent said aperture; said aperture having a transverse dimension smaller than said narrowest transverse dimension of said artery; said internal surface of said evaporation chamber having a capillary channel for distributing said working fluid in liquid phase within said evaporation chamber; said capillary channel intersecting said aperture in said internal surface; said capillary channel having a transverse dimension smaller than said transverse dimension of said aperture.

4,520,866

FALLING FILM EVAPORATION TYPE HEAT EXCHANGER

Tadakatsu Nakajima, Ibaraki; Wataru Nakayama, Kashiwa, and Takahiro Daikoku, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 26, 1983, Ser. No. 498,554

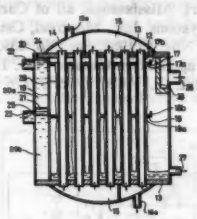
Claims priority, application Japan, May 26, 1982, 57-87934

Int. Cl.³ A23C *3/04*

U.S. Cl. 165—115 **18 Claims**

1. A heat exchanger comprising an outer shell, a plurality of heat transfer tube means disposed substantially vertically in said outer shell, means for supplying a fluid to said heat tranfer tube means, means for supplying a liquid refrigerant, liquid refrigerant distributor means disposed at least at an upper and intermediate portion of the respective heat transfer tube means communicating with said liquid refrigerant supplying means for causing a liquid refrigerant to freely fall as a film of refrigerant along an outer peripheral surface of each of said heat transfer tube means, and vapor discharge means and liquid

refrigerant discharge means disposed in a side wall of said outer shell so as to enable an evaporation of said film of refrig-



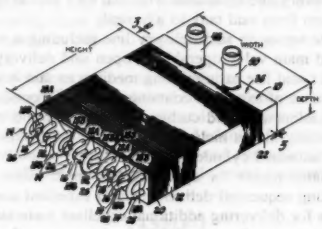
erant and discharge of liquid refrigerant whereby a heat exchange is effected between said fluid flowing through said heat transfer tube means and the film of refrigerant.

4,520,867

SINGLE INLET/OUTLET-TANK U-SHAPED TUBE HEAT EXCHANGER

Demetrio B. Sacca, Lockport; Edward H. Sanderson, and Paul K. Beatenbough, both of Medina, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 6, 1984, Ser. No. 577,178
Int. Cl.³ F28F *9/26*
U.S. Cl. 165—144 **3 Claims**



1. A heat exchanger comprising a tank having a header plate, a plurality of tubes each having at least two legs joined by a return bend, the legs of said tubes extending through and terminating with an open end at one side of said header plate, a first group of said tubes being arranged so as to each have their two open ends located in one and the other of two outboard rows extending longitudinally of said header plate, a second and remaining group of said tubes being arranged with their return bends criss-crossing those of alternate tubes in said first group and their open ends all located in a third and inboard row extending between said two outboard rows, and partition means in said tank for cooperating with said header plate to define an inlet chamber and an outlet chamber in said tank open respectively to the open tube ends in one and the other of said two outboard rows and also to alternate ones of the open tube ends in said inboard row whereby each said tube is connected to effect two-pass flow between said chambers.

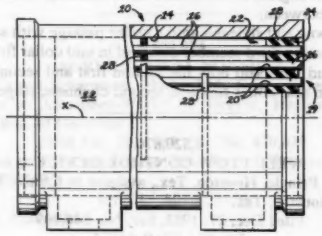
4,520,868

HEAT EXCHANGER

Charles E. Grawey, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 22, 1982, Ser. No. 443,811
Int. Cl.³ F28F *9/04*
U.S. Cl. 165—158 **12 Claims**

1. A heat exchanger, including a rigid, longitudinally-extending, peripheral shell, an end plate of elastomeric material disposed at at least one end of said shell and said elastomeric material having a hardness in the range of about 45 durometer to about 80 durometer as measured on the Shore A scale, a multiplicity of elongate tubes disposed longitudinally within the shell and extending through said end wall, said peripheral shell having an inner wall for urging an outer periphery of the end plate inwardly and maintaining a compressive stress on the periphery of the end plate, and each of said tubes having an external surface area for urging a portion of the end plate circumscribing each of said tubes in a direction radially outwardly from each of the tubes and maintaining a compressive stress on the end plate in a transverse direction with respect to the longitudinal direction of said tubes sufficient, when com-



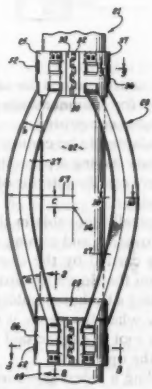
bined with the compressive stress on the periphery of the end plate, to expand the end plate in the longitudinal direction about one-third ($\frac{1}{3}$) greater than the longitudinal dimension of said end plate when measured in an unconfined state, and a plurality of unitary baffle plates disposed within said shell in a predetermined spaced relationship along and normal to said longitudinally disposed tubes, each baffle plate having a multiplicity of openings for respectively supporting some of said tubes, and formed of a vibration energy absorbing material having a hardness less than a predetermined hardness of said tubes.

4,520,869

CENTRALIZER FOR WELL CASINGS

Bert N. Svenson, 9259 Raviller Driver, Downey, Calif. 90240

Filed Sep. 29, 1983, Ser. No. 537,096
Int. Cl.³ G21B *17/10*
U.S. Cl. 166—241 **24 Claims**



1. In a centralizer for a well casing, said centralizer comprising a plurality of bows joined at the bow ends to first and second collars, respectively, the improvement wherein:

each of said collars comprises an arcuate band with a bow receiving section for each bow, each of said bow receiving sections having first and second aligned channels formed

in a first direction and a third channel formed in a second opposite direction and aligned with said first and second channels defining a bow receiving passage,

with a first opening between said first and second channels in which said third channel is disposed, and with each of said channels having a central section and opposed parallel edges, with both opposite edges of each channel and the intermediate central sections formed as an integral part of said collar; and wherein

each of said bows comprises an arcuate strip with a collar engaging section at each end, each of said collar engaging sections having formed therein a hat section with first and second aligned members and an upstanding third member therebetween;

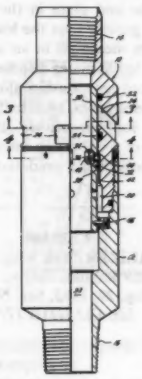
with a bow end slideable into a collar passage with said bow hat section third member disposed in said collar first opening and with said bow hat section first and second members in said collar first and second channels, respectively.

4,520,870

WELL FLOW CONTROL DEVICE

Ronald E. Pringle, Houston, Tex., assignor to Cameo, Incorporated, Houston, Tex.

Filed Dec. 27, 1983, Ser. No. 566,109
Int. Cl.³ E21B *34/14*
U.S. Cl. 166—317 **6 Claims**



1. A well flow control device for use in an oil and/or gas well tubing string for communicating between the tubing string and the annulus comprising,

a tubular body adapted to be connected in a tubing string in a well, said body having a plurality of openings for communication between the interior of the body and the outside of the body,

a sleeve telescopically movable in the interior of the body and initially covering and closing said openings,

at least one dog carried by the sleeve, said dogs movable outwardly from the sleeve towards the body,

said body including a backup shoulder positioned to hold the dogs inwardly when the sleeve is covering said openings for allowing a tool to engage said dogs, move the sleeve, and uncover the openings,

said body including a recess positioned to receive the dogs when the sleeve is moved to a position uncovering said openings,

releasable means between the sleeve and the body initially preventing moving of the sleeve relative to the body, and

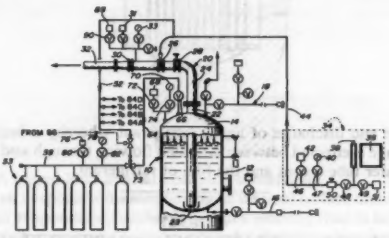
the sleeve includes a window for each dog, said windows having tops and bottoms which taper upwardly and inwardly for supporting said dogs.

4,520,871

FIRE EXTINGUISHING SYSTEM

Walter G. Miller, Mississauga; Michel Macé, Montreal, and George Zitterbart, Mississauga, all of Canada, assignors to Wormald Fire Systems, Inc., Montreal, Canada

Filed Nov. 5, 1982, Ser. No. 439,546
Claims priority, application Canada, Nov. 1, 1982, 414603
Int. Cl.³ A62C *1/06, 13/26*
U.S. Cl. 169—43 **14 Claims**



1. A fire extinguishing system comprising:

(a) a tank;

(b) a fire extinguishing medium partially filling said tank;

(c) an expellant material under pressure in the remaining part of the tank, said material defining a pressure cushion acting on said medium;

(d) a delivery line associated with said tank for carrying said medium from said tank to a hazard;

(e) valve means in said delivery line including a normally closed main valve operable to open said delivery line to deliver said fire extinguishing medium to said hazard;

(f) a reserve of expellant containing means in conduit communication with said cushion in said tank, said expellant containing means including a plurality of groups of serially connected cylinders;

(g) actuator means for operating said main valve and for initiating sequential delivery of said expellant containing means for delivering additional expellant material to said tank to maintain a predetermined pressure therein for quick and total evacuation of said medium from said tank to said hazard.

4,520,872

EMERGENCY FIREHOSE SWITCHOVER DEVICE FOR WELLS AND THE LIKE

Ardee R. Holman, Box 1210, Wasilla, Ak. 99687

Filed Aug. 29, 1983, Ser. No. 527,491
Int. Cl.³ A62C *35/00*
U.S. Cl. 169—54 **14 Claims**

1. An emergency fluid supply system in combination with a well having an electrically operable pump supplying fluid to a structure having a first fluid distribution system, electric power supply means and an electric distribution system, comprising:

(a) a second fluid distribution system in fluid communication with said pump;

(b) valve means connecting said first and second fluid distribution systems and having a first position associated with fluid supply to said first fluid distribution system and a second position associated with fluid supply to said second fluid distribution system;

(c) switch means in electrical connection with said power supply means, said pump and said electric distribution means and having a first position associated with power supply to said pump and said electric distribution system and a second position associated with power supply to said pump only;

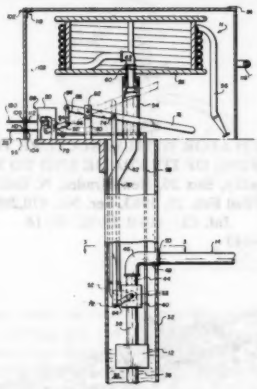
(d) said valve means first position being associated with said switch means first position and said valve means second

position being associated with said switch means second position;

(e) actuator means operably interconnecting said valve means and said switch means for simultaneously positioning said valve means and said switch means in a preselected associated one of said first and second positions;

(f) said valve means being disposed in said well;

(g) said actuator means comprises a rod connected to said valve means for positioning said valve in a preselected one



of said first and second positions and said rod extending upwardly from said well;

(h) a platform disposed adjacent the upper portion of said well;

(i) a support secured to said platform;

(j) said switch means secured to said platform; and,

(k) lever means pivotably secured to said support and to said switch means and said rod and adapted for simultaneously positioning said switch means and said valve means in an associated one of said first and second positions.

4,520,873

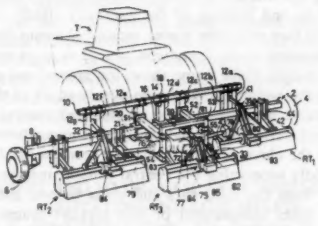
TRACTOR-DRIVEN AGRICULTURAL APPARATUS INCLUDING A PLURALITY OF ROTARY-DRIVEN AGRICULTURAL UNITS

Nir Gefen, Hagalil Hamaaravi, Israel, assignor to Eshet Eilon, Hagalil Hamaaravi, Israel

Filed Jun. 10, 1983, Ser. No. 503,292

Int. Cl.³ A01B *71/06, 33/02*

U.S. Cl. 172—47 **10 Claims**



1. Agricultural apparatus for attachment to a tractor having a rotary take-off shaft, comprising:

a main frame attachable at its front end to the rear end of the tractor to extend transversely thereacross;

a pair of ground-engaging wheels carried on the opposite ends of said main frame for supporting it when towed by the tractor;

first and second rotary-driven agricultural units spacedly mounted from each other on the opposite sides of the main frame along a common axis rearwardly of the main frame;

a third rotary-driven agricultural unit mounted on the main frame centrally between and in overlapping relation to said first and second units and rearwardly of their common axis;

and transmission means coupling said first, second and third agricultural units to the power take-off shaft of the tractor so as to be driven thereby;

said first, second and third agricultural units each being independently mounted to said main frame by a separate three-point connection permitting independent floating movement thereof with respect to the ground.

4,520,874

AGRICULTURAL MACHINE

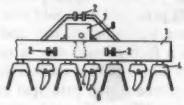
Franz Grosse-Scharmann, Hude, Fed. Rep. of Germany, assignor to Amazonen-Werke H. Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany

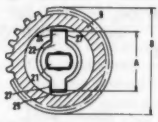
Filed Feb. 25, 1983, Ser. No. 470,029

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1982, 3207749

Int. Cl.³ A01B *33/06*

U.S. Cl. 172—49.5 **6 Claims**





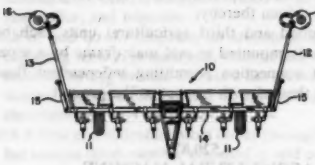
1. In an agricultural machine having a frame on which tool rotors are mounted in a row on upright shafts extending across the direction of travel, said rotors being driven by a horizontal driveshaft that is segmented and interlocked by couplings, wherein each segment of the driveshaft is a component of one of a plurality of angular gears that drive the tool rotors, a main train having a housing mounted on the frame and an output gearwheel mounted in the housing by bearings, the horizontal driveshaft being coupled through coupling means inside the housing of the main train with the output gearwheel of the main train, said coupling means forming said couplings, said driveshaft being driven by said output gearwheel, the improvement comprising: guide means for aligning the central axis of the driveshaft components with the center line of the output gearwheel of the main train, the guide means disposed at least between the main train and the angular gears of the tool rotors that are immediately adjacent to it and wherein the coupling means comprises coupling elements in the output gear wheel and a coupling component rigidly attached to the driveshaft components extending into the main train, said coupling component including other coupling elements engaging the coupling elements in the output gearwheel with play inside the output gearwheel bearings.

4,520,875

MARKER FOR TILLING IMPLEMENTS

Harry C. Deckler, South Bend, Ind., assignor to White Farm Equipment Company, Oak Brook, Ill.

Filed Oct. 28, 1983, Ser. No. 546,279
Int. Cl.³ A01B 69/02
U.S. Cl. 172—126 1 Claim



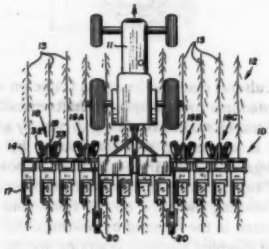
1. Soil marking means for soil tilling implements including planters, comprising, a marker support arm and a soil marker assembly, said soil marker assembly comprising, a soil-engaging disc, yieldable support means for said disc in the form of a generally C-shaped leaf spring having a proximal end and a distal end, means for attaching said proximal end of said yieldable support means to the distal end of said marker support arm, and means for rotatably attaching the center of said disc to the distal end of said yieldable support means and allowing said disc to rotate on its principal axis, said disc being oriented with respect to said marker support arm and said yieldable support means so that a face of said disc is turned generally toward the direction of travel of said marker support arm and said soil and tilling implement, the principal axis of said disc falls between about 15° to 30° to either side of said direction of travel and is tilted downwardly and forwardly at an angle between about 5° to 15°.

4,520,876

GAUGE AND GUIDE WHEEL ASSEMBLY

Richard L. Peterson, Le Sueur; Roger J. Scheurer, Kasota, and Richard W. Steinberg, North Mankato, all of Minn., assignors to Hiniker Company, Mankato, Minn.

Filed Aug. 26, 1983, Ser. No. 526,681
Int. Cl.³ A01B 63/16
U.S. Cl. 172—427 19 Claims



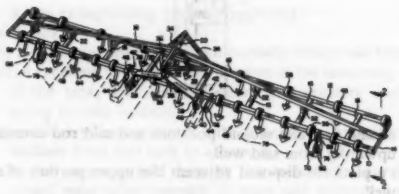
1. A wheel assembly for an implement having a transverse tool bar comprising: an arm, first means adapted to be connected to the tool bar, pivot means pivotally connecting the arm to the first means to allow pivotal movement of the arm about a generally horizontal axis, second means connected to the arm to hold the arm in a selected position relative to the tool bar, a pair of wheel and axle means for supporting the arm and tool bar above the ground, each wheel and axle means having a ground engaging wheel and axle rotatably supporting a wheel, each axle having a first section and a second section, said second section extended at an angle relative to the longitudinal axis of the first section, means rotatably mounting a wheel on the first section of each axle, first sleeve means mounted on the arm for selectively connecting the axles of the arm, said second section of each axle being mounted on the first sleeve means in a position to hold the wheels in a toe-out and camber position, and second sleeve means mounted on the arm, said second section of each axle being mounted on the second sleeve means in a position to hold the wheels in upright spaced side-by-side positions.

4,520,877

ROW CULTIVATOR WITH STRUCTURE TO INHIBIT BOWING OF ITS FRAME END TO END

Bruce F. Magelky, Box 26, New Hradec, N. Dak. 58648

Filed Feb. 28, 1983, Ser. No. 470,298
Int. Cl.³ A01B 39/02, 39/18
U.S. Cl. 172—643 4 Claims



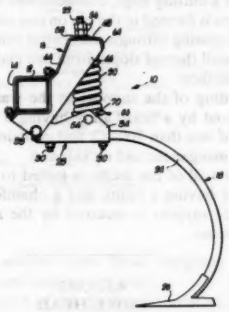
1. A multi-row crop cultivator adapted to move along rows of crop for digging up weeds from between the rows comprising; generally rigid bars and cross braces rigidly interconnected to form an elongated unified frame extending lengthwise laterally of the direction of movement and adapted to be carried in a suspended relationship over the ground, weed digging and cultivating teeth, spring biased mounting means mounting the teeth below the frame at spaced intervals along the elongated unified frame for shallow digging of weeds and limited retraction upon engaging solid objects, said teeth arranged on the frame to provide open spacings thru which multiple rows of crop are adapted to be passed as the weeds between the rows are dug up by the teeth, depth limiting wheels mounted on the frame to establish the height at which the frame is carried over the ground and along the rows in a cultivating operation, said frame being sufficiently extensive to incur end to end bowing of the generally rigidly interconnected rigid bars and cross braces, structural means for inhibiting such bowing of the frame end to end so as to maintain a consistant height of the frame above the ground and to generally apply the weight of the frame evenly to all of the teeth, said structural means including an elevated central support member and vertically extended support braces between the frame and the elevated central support member, said support braces rigidly supporting the central support member spaced upwardly from the rigid bars and cross braces, and a rigid overhead beam independent of said support braces for the central support members extending substantially the entire distance from each end of the frame to the elevated central support member, each said overhead beam being anchored on said central support member and oriented substantially perpendicular to the direction of movement, each said overhead beam further extending diagonally upwardly from the frame to the central support member to establish with the central support member a triangular support configuration on each side of the frame.

4,520,878

SPRING CUSHION CHISEL PLOW SHANK ASSEMBLY

David R. Smith, and Maynard M. Herron, both of Hesston, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Jun. 23, 1983, Ser. No. 507,279
Int. Cl.[3] A01B 61/04, 35/24
U.S. Cl. 172—705 6 Claims



1. A tillage shank assembly comprising:
a bracket having one end provided with an aperture;
an earthworking shank pivotally coupled with said bracket remote from said one end thereof for swinging movement generally toward and away from said one end about a transverse axis;
a coil spring interposed between said one end of the bracket and said shank for yieldably biasing the latter away from said one end about said axis;
an elongated member housed within said spring longitudinally thereof;
means at one terminus of the member pivotally coupling the same with said shank and including transverse pivot means,
said member having its opposite terminus telescopically received within said aperture for extension and retraction therethrough during said swinging movement of the shank; and
retainer means adjacent said one terminus of the member for maintaining the coils of the spring in radially spaced relation to said element throughout the length of the spring in all positions of said swinging movement of the shank whereby to avoid transverse loading on said member by the spring,
said retainer means including a seat on said pivot means for one end of said spring having generally longitudinally projecting structure integral with the seat confining the spring against movement on the seat,
said seat and said member being coupled with said pivot means independently of one another, and said one end of the bracket engageably confining the opposite end of the spring against lateral movement, whereby said member is isolated from transverse loading forces imparted to the seat and the bracket by said spring.

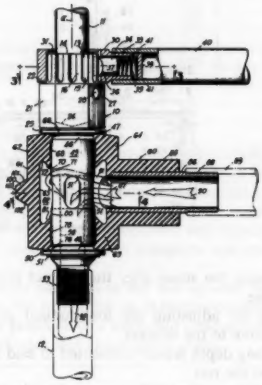
4,520,879

RATCHET AND HYDRAULIC SEAL ASSEMBLY FOR ROTATING HOLLOW SHAFTS

Robert C. MacElvain, Eufaula, Ala., assignor to Deep Rock Manufacturing Company, Inc., Opelika, Ala.

Filed Jun. 4, 1982, Ser. No. 384,892
Int. Cl.[3] E21B 1/00
U.S. Cl. 173—57 2 Claims

1. A ratchet and hydraulic seal assembly for transferring power from a rotating drive shaft to a drill pipe and for directing drilling fluid into the drill pipe comprising:
(a) a power transfer pipe, having at its upper end a ratchet member with circumferentially spaced teeth, a pawl for engaging said teeth, a rotatable cap carrying said pawl, means for rotating said cap to rotate through said pawl said power transfer pipe, a shank integrally joined to said ratchet member, said shank having a port and a hollow interior communicating with said port, and a tubular lower threaded end for receiving a drill pipe thereon, said hollow interior communicating with said drill pipe through said lower end;
(b) an elastomeric hydraulic seal assembly having a sleeve providing a chamber surrounding said shank, a collar communicating with said sleeve for introducing drilling fluid into said chamber for passage through said port and said hollow interior;
(c) said shank being provided with a pair of spaced circumferential grooves;



(d) said sleeve including seals on opposite ends of said chamber, surrounding said shank and received respectively in said grooves;
(e) said seal assembly being composed of an elastomer and a lubricant incorporated into said elastomer;
(f) said seals being in tension in said grooves;
(g) said sleeve including second seals surrounding said shank and inwardly of said first mentioned seals;
(h) said second seals protruding inwardly and seating with pressure of said drilling fluid against said shank; and
(i) said ratchet member including a ring having a bore for receiving the end of said drive shaft and a shear pin securing said pipe to said drive shaft.

4,520,880

AUTOMATIC STONE CUTTER

Yoshitaka Saito, 13 2-chome, Yamato-cho, Kasuga-shi, Fukuoka, Japan

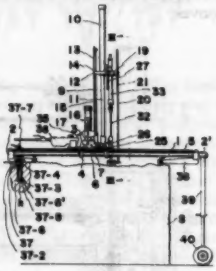
Filed Jun. 6, 1983, Ser. No. 501,249
Int. Cl.[3] E21C 41/12
U.S. Cl. 175—51 2 Claims

1. An automatic stone cutter comprising:
a base,
a support including elongated rail means supporting said base for movement along a predetermined path along a stone to be cut,
a drill for forming a hole in the stone,
a cylinder mounted on said base for movement generally perpendicularly to said rail means and toward and away from the stone,
means mounting said drill on said cylinder means for movement with the cylinder means toward and away from the stone,
a sprocket shaft rotatably supported on said base,
a sprocket on said shaft,
means on said support engaging said sprocket for moving

said base along the rail means in response to rotation of the sprocket,

a rod having a stone contact member at one end for contacting a surface of the stone to cut,

mounting means for mounting said rod on a bracket connected to said cylinder for movement with the cylinder between a first position in which the contact member engages the surface of the stone to be cut, and a second position in which the contact member is spaced from the surface of the stone, said mounting means comprising a lost motion connection between the bracket and the rod for permitting the cylinder and drill to continue to move



toward the stone after the contact member engages the stone,

means for adjusting the longitudinal position of the rod relative to the bracket,

a drilling depth sensor connected to said rod for movement with the rod,

a sensor operating rod connected to the cylinder for movement with the cylinder and drill toward the stone, from a position in which the operating rod is spaced from the sensor, to a position in which the operating rod engages the sensor, so that the sensor operating rod engages the sensor to stop further movement of the cylinder when a hole of predetermined depth is formed.

4,520,881

TOOL COMPONENT

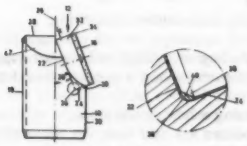
Cornelius Phaal, 34 Rutland Ave., Craighall Park, Johannesburg, Transvaal, South Africa

Filed Sep. 21, 1983, Ser. No. 534,195

Claims priority, application South Africa, Sep. 24, 1982, 82/7030

Int. Cl.³ E21B *10/46*

U.S. Cl. 175—329 **16 Claims**



1. A tool component comprising:

(a) a composite compact comprising an abrasive compact bonded to a cemented carbide support;

(b) a solid, elongate cylindrical pin made of cemented carbide having end surfaces joined by side surfaces;

(c) a recess formed in the pin and comprising a base wall and side walls; and

(d) the composite compact being located in the recess such that the carbide support is received by the recess and bonded to the walls thereof and the abrasive compact presents a cutting edge, characterised in that:

the recess is formed in the pin on one side of a longitudinal plane passing through the central axis of the pin and the base wall thereof slopes from one end surface towards a side surface;

the bonding of the support to the walls of the recess is achieved by a braze alloy having a working temperature of less than 700° C. and containing silver, copper, zinc, manganese and nickel; and

the base wall of the recess is joined to the side wall by a corner having a radius and a chamfered corner of the carbide support is received by the radiused corner of the recess.

4,520,882

DRILL HEAD

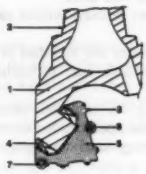
Hans B. van Nederveen, Zeist, Netherlands, assignor to SKF Industrial Trading and Development Co., B.V., Nieuwegein, Netherlands

Division of Ser. No. 887,931, Mar. 17, 1978, Pat. No. 4,276,788. This application Nov. 20, 1980, Ser. No. 208,533

Claims priority, application Netherlands, Mar. 25, 1977, 7703234

Int. Cl.³ E21B *10/36*

U.S. Cl. 175—410 **2 Claims**



1. In a drill head including a core and a plurality of hard wear-resistant cutting elements, the core comprising powder metal isostatically compacted in a compressible mold, and each of said cutting elements comprising a shank part having opposite ends with a cutting tip at one of said ends, a base part at the end of the shank part opposite from the cutting tip, said base part comprising a flange extending radially outward, said shank part and the base part being embedded in said core in a non-separable bond therewith, said shank part having a tapered shape becoming greater in the direction of said base part, said cutting element thereby fixedly positioned in said core in a manner inhibiting premature loosening of the cutting element from the core body, and said cutting tip extending from the exposed end of said shank part and projecting outward from the surface of said core part.

4,520,883

COMBINATORIAL WEIGHING METHOD AND APPARATUS WITH VOLUME SENSING

Masao Fukuda, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 9, 1983, Ser. No. 530,681

Claims priority, application Japan, Sep. 11, 1982, 57-158348

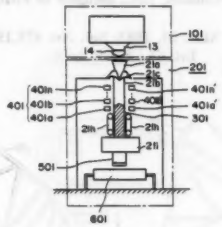
Int. Cl.³ G01G *19/22*

U.S. Cl. 177—1 **11 Claims**

1. A combinatorial weighing method comprising the steps of:

(a) combining weight data from a plurality of weighing ma-

chines of a combinatorial weighing apparatus for weighing articles to obtain the respective combination from said weighing machines giving a total combined weight value that is closest to a target value and which is within preset allowable limits thereof;



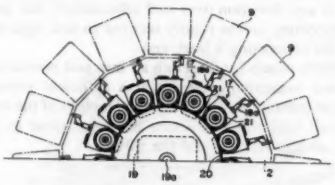
(b) discharging the articles from those weighing machines belonging to the combination obtained;
(c) obtaining the volume of the discharged articles; and
(d) correcting said target value, based on the magnitude of the volume obtained, for subsequent operation of said combinatorial weighting apparatus.

4,520,884

HOOPER DOOR OPENING MECHANISM FOR AUTOMATIC WEIGHING APPARATUS

Yoshiharu Mikami, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Nov. 8, 1983, Ser. No. 549,762
Claims priority, application Japan, Aug. 11, 1982, 57-168833[U]
Int. Cl.³ G01G *19/00, 13/18*
U.S. Cl. 177—58 **7 Claims**



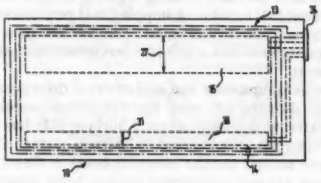
1. An automatic weighing apparatus comprising:
a supporting platform;
an article supply unit disposed on said supporting platform, for supplying articles to be weighed;
a plurality of hoppers disposed adjacent to said article supply unit, for receiving articles from said article supply unit, each said weighing hopper having a gate;
a plurality of weighing machines disposed on said supporting platform and respectively associated with said hoppers, for weighing articles contained in said hoppers;
a drive mechanism disposed at the center of and below said supporting platform; and
a plurality of hopper gate opening devices disposed on the bottom of said supporting platform inwardly of and respectively associated with said hoppers, each hopper gate opening device including a drive shaft rotated constantly by said drive mechanism, a push rod for opening the gate of the hopper associated with each hopper gate opening device, and transmission means for transmitting the rotational motion of said drive shaft to said push rod.

4,520,885

LOAD SENSING APPARATUS WITH CAPACITIVE AND INDUCTIVE SENSORS

Peter Jeffrey, Liverpool, England, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 5, 1982, Ser. No. 405,488
Claims priority, application United Kingdom, Aug. 5, 1981, 8123898
Int. Cl.³ G01G *3/00, 7/06*
U.S. Cl. 177—210 C **19 Claims**



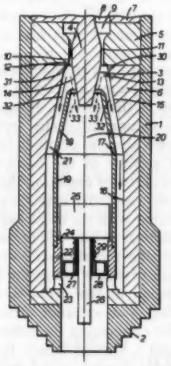
1. A load-sensing mat comprising:
(a) at least one pair of superposed spaced, substantially planar conductive elements embeded in the mat by a flexible resilient material, said pair of conductive elements constituting capacitance plates operative to produce an electric signal in response to the spacing between said capacitance plates when the mat is loaded to compress said resilient material; and
(b) a conductive loop embeded in the mat by said flexible resilient material for providing an inductance-dependent indication of the presence of a load, said conductive loop being disposed around said capacitance plates.

4,520,886

ROTARY DRILLING TOOL WITH PERCUSSION DEVICE

Lionel Marais, Paris, France, assignor to Compagnie Francaise des Petroles, Paris, France

Filed Jul. 6, 1983, Ser. No. 511,357
Claims priority, application France, Jul. 7, 1982, 82 11980
Int. Cl.³ E21B *4/14*
U.S. Cl. 173—135 **6 Claims**



1. A rotary drilling tool including a percussion device which comprises;
an annular nozzle (3) comprising, continuously and without interruption from upstream to downstream, a first annular element (5) defining an annular inlet neck (9) in communication with an upstream passage (8) for the introduction of drilling mud, a cylindrical annular duct (10) provided

between an internal cylindrical surface (11) and an external cylindrical surface (12), and a second annular element (6) defining a divergent annular duct (13) provided between an internal convergent conical surface (14) and an external divergent conical surface (15);

a hollow part (17) with an upstream portion (18) of divergent conical shape projecting into said divergent annular duct and dividing it into a central flow path (20) and a peripheral flow path (21), and a downstream portion (19) of cylindrical shape;

a percussion head (25) located in said downstream portion of said hollow part and forming a piston therein; and

an abutment (24) capable of stopping said percussion head in the downstream direction, said central flow path being at least partially closed when said percussion head abuts said abutment;

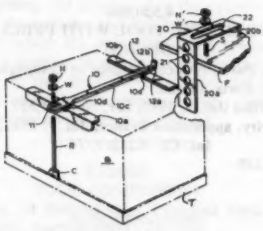
wherein, at an upstream end said external divergent conical surface directly adjoining the cylindrical annular duct, said external divergent conical surface (15) has a larger diameter than said external cylindrical surface (12), said first and second annular elements being in direct contact and said external cylindrical surface being directly connected to said external divergent conical surface to define an abrupt and turbulence generating radial step (31), which makes flow along said peripheral flow path unstable and tends to restore flow automatically into said central flow path.

4,520,887

BATTERY HOLDDOWN ARRANGEMENT

Robert DiFazio, New York, N.Y., assignor to D & S Plug Corporation, Deer Park, N.Y.

Filed Feb. 4, 1983, Ser. No. 463,979
Int. Cl.³ B60R *18/02*
U.S. Cl. 180—68.5 **11 Claims**



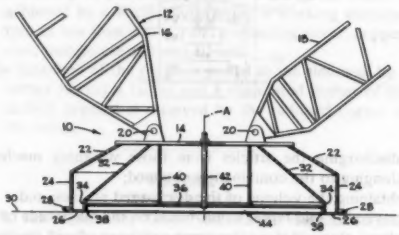
1. Apparatus for securing a storage battery or the like to a mounting, comprising spaced apart arm means for engaging opposite upper edges of the battery, elongate cross-bar means of rectangular cross-section integrally formed with and connected adjacent its opposite end portions to said arm means for bridging the upper surface of the battery, said arm means comprising angle brackets for engaging the upper edges of the battery and having downwardly extending portions, securing means integrally formed with the cross-bar means and extending along the longitudinal axis of the cross-bar means beyond one of said arm means for securing said one of said arm means to the battery mounting; means integrally formed with and as a longitudinal extension of the other end of said cross-bar means and terminating in an upstanding part beyond the other of said arm means for connecting the other of said arm means to said mounting; and L-shaped means for securing said upstanding part, integrally formed on the cross-bar means, to the mounting comprising: a series of vertically spaced apertures in one leg of said L-shaped means for selectively receiving said upstanding part therein; and means in the other leg of said L-shaped means adapted to accommodate means for fixing said L-shaped means to the mounting, said upstanding part having an inner face, facing said other arm means and extending a distance beyond the other arm means substantially equal to the thickness of said one leg of said L-shaped means, wherein said one leg is secured between said upstanding part and said downwardly extending portion of said other arm means when said battery is mounted and secured.

4,520,888

LOAD SUPPORTING STRUCTURE

Marvin L. Wolf, Houston, Tex., assignor to FMC Corporation, Chicago, Ill.

Filed Mar. 24, 1983, Ser. No. 478,194
Int. Cl.³ B60V *1/06*
U.S. Cl. 180—125 **8 Claims**



1. A load supporting structure for supporting and maintaining a load thereon stable when being moved on a substantially flat supporting surface comprising:

means defining a low volume substantially constant capacity pressure chamber with one wall thereof being a portion of the flat surface and having a large area, said pressure chamber including an upper wall disposed adjacent to said flat surface, and an annular outer wall rigidly secured in air tight engagement to said upper wall;

means defining a rigid annular foot encompassing the outer wall of said pressure chamber and having a planar lower surface supported on the flat supporting surface, said rigid annular foot including an upturned outer annular lip for permitting sliding movement of the load supporting structure in any direction over said substantially flat surface;

load supporting means rigidly secured to said rigid annular foot for supporting a load; and

controllable means for directing air into said pressure chamber and maintaining the air at a sufficient pressure to support substantially all of the total weight of the load and the load supporting structure but insufficient to lift the rigid annular foot off said flat surface.

4,520,889

GUIDANCE CONDUCTOR FOR DRIVERLESS VEHICLE

Eiji Abe, and Junpei Kanazawa, both of Ise, Japan, assignors to Shinko Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 239,458, Mar. 2, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 508,418
Int. Cl.³ B62D *1/24*
U.S. Cl. 180—168 **1 Claim**

1. A control system for a driverless vehicle which is guided along a track way by detecting an induction field comprising:

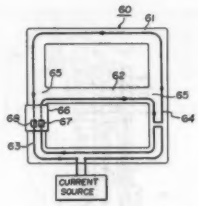
a guidance conductor arranged substantially throughout and within said track way to form a closed circuit, said track way including a main portion wherein portions of said guidance conductor are arranged in parallel with each other in a predetermined spaced relationship and a loop portion wherein only one portion of said conductor is laid;

energizing means connected to said guidance conductor for feeding a high frequency current to generate said induction field around said guidance conductor;

a pair of detectors, each said detector being disposed respectively on a side of said driverless vehicle corresponding to a respective edge of said track way, said detectors being

arranged to have said predetermined space therebetween for selectively detecting the induction field generated by the conductor portion, if any, laid along the corresponding edge of the track way; and

selection circuit means for selecting one of said conductor portions in accordance with a selected route of said track way along which said vehicle is guided;



wherein each said detector comprises a first detection coil disposed parallel to the plane of said track way and perpendicular to said guidance conductor; and

a second detection coil disposed substantially in a vertical plane including said guidance conductor and inclined to the horizontal plane of said track way.

4,520,890

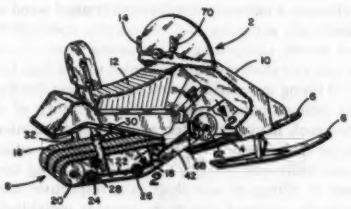
BRAKE ARRANGEMENT FOR SNOWMOBILE

Gregory J. Marier, Forest Lake, Minn., assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 1, 1983, Ser. No. 518,958

Int. Cl.³ B62M *27/02*

U.S. Cl. 180—193 **3 Claims**



1. In a snowmobile of the type having a frame, steerable skis mounted on the forward end of said frame, motor means mounted on said frame, a variable speed transmission coupling said motor to a drive shaft which is journaled for rotation transversely of said frame, an elongated chain case pivotally secured at one end thereof to said drive shaft for limited angular rotation thereabout, a track support means including a track drive assembly, said track support means defining an orbital path for an endless ground-engaging track, said track support means being pivotally coupled to the other end of said chain case and said track drive assembly being driven by a chain coupling contained within said chain case and extending between said drive shaft and said track drive assembly, the improvement comprising:

(a) braking means disposed between said drive shaft and said chain case for stopping rotation of said drive shaft while simultaneously transferring weight to said steerable skis.

4,520,891

MOTORCYCLE

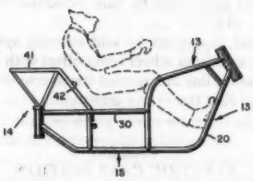
Bruce D. Omholt, 2117 Richmond, NW., Grand Rapids, Mich. 49504

Division of Ser. No. 155,611, Jun. 2, 1980, Pat. No. 4,413,699. This application Apr. 25, 1983, Ser. No. 487,969

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.³ B62K *11/04*

U.S. Cl. 180—219 **1 Claim**



1. In a two-wheeled vehicle having a front wheel, a rear wheel and an engine, the improvements comprising: frame means comprising a forward frame section, an intermediate frame section and a rear frame section, all of said frame sections providing a rigid integral frame for said vehicle and characterized in that the top of said intermediate frame section lies substantially below the tops of said other frame sections; means mounting said front wheel to said forward frame section; means mounting said engine to said forward frame section; foot rest means mounted for supporting the feet of a rider in a forward position relative to the knee of the rider and adjacent the forward frame section to define a link angle at the knee of approximately 110° or greater; means for mounting said rear wheel to said rear frame section; and seat means having a seat portion and a backrest portion, said seat portion being mounted directly above said intermediate frame section and said backrest portion extending upwardly and rearwardly for supporting the lumbar region of a rider at an angle in the approximate range of 25–30 degrees relative to the vertical and for supporting the thoracic region of a rider and secured to the upper portion of said rear frame section, whereby a rider positioned on said seat means in operating relation to the vehicle and in supporting relation with said seat means has a link angle at the hip within the approximate range of 95°–100° and greater link angles at the knee and ankle and has his legs straddling the forward frame section and engine when his feet are positioned on said foot rest means.

4,520,892

TWO-WHEELED VEHICLE WITH OFFSET WHEEL

Kazuo Satoh, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1983, Ser. No. 467,208

Claims priority, application Japan, Feb. 17, 1982, 57-24181

Int. Cl.³ B62K *11/02*

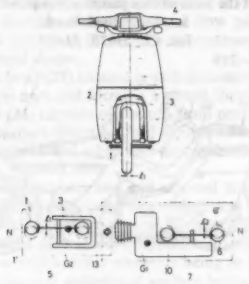
U.S. Cl. 180—219 **12 Claims**

1. A two-wheeled vehicle, comprising:

a vehicular body inclusive structure having the center of

gravity thereof deviated in a first transverse direction from the vehicle center line;

a steering system inclusive structure which is transversely turnable and pivotably connected to said vehicular body inclusive structure;



a rear wheel supported by said vehicular body inclusive structure; and

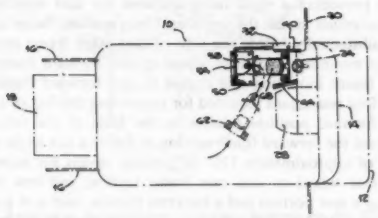
a front wheel supported by said steering system inclusive structure, said front wheel being offset with respect to said vehicle center line in a second transverse direction, opposite to said first transverse direction.

4,520,893

ELECTRIC CART STATION

Rickey Keough, P.O. Box 1571, 2336 Blake St., San Bernardino, Calif. 92405

Filed Jan. 7, 1983, Ser. No. 434,907
Int. Cl.³ A61G *5/04*; B62D *27/06*
U.S. Cl. 180—326 **7 Claims**



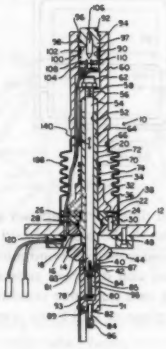
1. In a motor vehicle having a body with a front end, a rear end and right and left sides, said body having an access door of a size to admit a motorized cart, said vehicle having a floor having a driver's station at the forward side portion thereof, a motorized cart with a seat thereon, a swivel connection between said seat and said motorized cart for rotating said seat from a forwardly facing position to a rearwardly facing position, locking means for securing said seat in said forward facing position, means for releasably restraining said motorized cart at the driver's station from forward, rearward, vertical, and lateral movement, said means including a rotable notched plate connected with the floor of said vehicle to block forward, vertical, and lateral movement of the motorized cart relative to the driver's station and the steering post of said motorized cart, and an angular member also connected with the floor of said vehicle to block rearward, vertical, and lateral movement of the motorized cart relative to the driver's station and the rear portion of said motorized cart, said restraining member being shiftable from a position engageable with the motorized cart to hold it against rearward, forward, vertical and lateral movement, to a position freeing the motorized cart for maneuvering thereof.

4,520,894

CONTROL WAND FOR OVERHEAD PERSONNEL CRANE

David L. Hensler, 3814 Darwood Ct., Fort Wayne, Ind. 46815

Filed Apr. 4, 1983, Ser. No. 481,621
Int. Cl.³ H01H *25/04*
U.S. Cl. 182—2 **19 Claims**



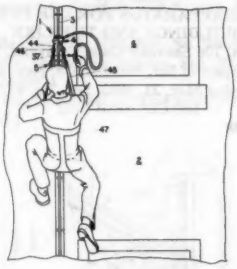
1. For use with an hydraulically driven overhead personnel crane which includes an elongated articulated arm having a personnel carrying enclosure secured to one end thereof and a plurality of hydraulic cylinders including electrically operated hydraulic cylinder control means operatively connected thereto for selectively controlling the operation of said hydraulic cylinders to maneuver said personnel enclosure in any selected direction in response to operation of one or more of said cylinders, a manually manipulated control wand apparatus for selectively actuating said electrically operated hydraulic control means comprising: a mounting base, an elongated tilting operator shaft pivotably coupled to said base for omnidirectional tilting movement, a first cam element fixedly secured to said tilting operator shaft, a first plurality of electrical switches each having a switch actuator and mounted to said base in an orthogonal array with said actuators adjacent said first cam, individual ones of said switches being operable in response to tilting of said shaft in a respective one of four orthogonally disposed directions towards individual ones of said switch actuators, adjacent ones of said switches being operable in response to tilting of said shaft in radial directions between said orthogonally disposed directions; a sliding operator shaft longitudinally slidably coupled to said tilting operator shaft, a second cam means fixedly secured to said sliding operator shaft, a pair of electrical switches each having a switch actuator and mounted to said tilting operator shaft in positions with said actuators in longitudinally spaced-apart relationship to adjacent ones of said second cam means, individual ones of said switches being operated in response to sliding movement of said sliding operator shaft in diametrically opposite directions; individual ones of said switches being operatively connected to predetermined ones of said hydraulic actuating means, said control wand apparatus being fixedly secured to said personnel carrier with said orthogonal axes disposed in directions corresponding to the direction of movement of said carrier resulting from actuation of that one of said switches disposed in said direction of movement.

4,520,895

BUILDING WALL DESCENT DEVICE HAVING MANUALLY OPERATED BRAKE MEANS

James A. Armstrong, 4911 Calvert, Cincinnati, Ohio 45209

Filed Sep. 21, 1983, Ser. No. 534,307
Int. Cl.³ A62B *35/00*
U.S. Cl. 182—3 **30 Claims**



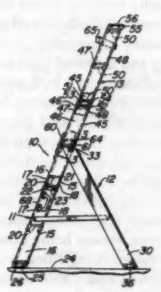
1. Apparatus for descending in a controlled fashion along an exterior building wall face comprising a vertically extending rail-like support track fixedly secured to the exterior building wall face, hand operable brake means slidingly cooperating with said track for descending therealong at a selectable rate, and means attached to said brake means for supporting the user, said brake means including manually operable clamp means for slidingly engaging said track and means for varying the clamp force between said clamp means and said track for controlling the rate of descent along said track.

4,520,896

FOLDABLE LADDER

Horace C. Disston, and Timothy J. Eichfeld, both of 217 S. Hurffville Rd., Deptford, N.J. 08096

Continuation-in-part of Ser. No. 264,299, May 18, 1981, and Ser. No. 515,559, Jul. 29, 1983,. This application Apr. 4, 1984, Ser. No. 596,835
Int. Cl.³ E06C *1/20, 1/383*
U.S. Cl. 182—22 **10 Claims**



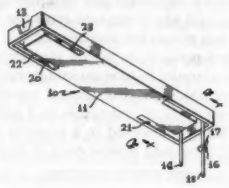
1. A foldable ladder comprising a lower step section for use inclined in one direction on a horizontal supporting surface, a strut having one end pivotally connected to one end of said lower step section for use inclined in the opposite direction on a horizontal supporting surface, limit means connecting said lower section and strut for limited swinging movement away from each other, an upper step section having one end pivotally connected to said one end of said lower step section for swinging movement between a retracted position lying along said lower step section and an extended position in alignment with said lower step section, a lug on one of said lower step section and strut, and a catch pivotally connected to said upper step section for swinging movement between a retracted position depending along said upper step section when the latter is retracted to a position depending from said upper step section into hooked engagement with said lug when said upper step section is extended, for retaining said upper step section securely extended.

4,520,897

PORTABLE STEPS

George B. Gebo, 4645 E. Industrial St., #2-E, Simi Valley, Calif. 93063

Filed May 14, 1984, Ser. No. 579,685
Int. Cl.³ E06C *7/08;* E04G *1/28*
U.S. Cl. 182—92 **2 Claims**



1. Portable steps comprising:

a plurality of elongated step rungs arranged adjacent to each other in parallel side-by-side relationship;

each step rung of said plurality including an elongated rigid member intended to be stepped upon incorporating a pair of ground engaging spikes at each end of said member for penetrating into the ground for a given length;

an adjustable gauge movably carried on said spikes adapted to engage with the ground to limit penetration of said spikes therein;

means for pivotally coupling said spikes at each end of said member so as to swing between a stowed position and an operative position for penetrating the ground; and

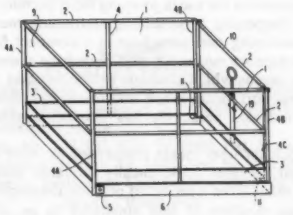
recesses provided in each end of said member for insertably receiving said spikes and intended to be occupied by said spikes in their stowed position.

4,520,898

FOLDING GUARD RAIL FOR A PLATFORM

Claude Allemane, 6, rue Chopin, 47000 Agen, France

Continuation of Ser. No. 346,030, Feb. 5, 1982,. This application Feb. 6, 1984, Ser. No. 577,485
Claims priority, application France, Feb. 5, 1981, 81 02450
Int. Cl.³ E04G *1/26, 1/34*
U.S. Cl. 182—113 **12 Claims**



1. A folding guard rail adapted to be placed on a platform having a horizontal surface and a plurality of sides, said guard rail comprising:

(a) two parallel sides, each of said parallel sides having an upper rail and a lower surface and means for rotatably connecting said parallel sides to said platform, said parallel

sides adapted to be positioned exteriorly of said platform sides when said guard rail is connected thereto, each of said parallel sides having a first end and a second end;

(b) a third side perpendicularly connected to said first end of each of said parallel sides;

(c) a fourth side perpendicularly journalled to said second end of each of said parallel sides; and

(d) means for maintaining said first, second, third and fourth sides of said guard rail in a first position exterior of said platform sides, said maintaining means comprising a key which is integrally connected to said fourth side, said key comprising a sliding shaft having a first end and a second end, said first end of said sliding shaft including a cross bar, said cross bar being adapted to be inserted into hooks located on said platform to render said guard rail immobile, said second end of said sliding shaft having a handle, said maintaining means further comprising a spindle for immobilizing said key when said cross bar is inserted into said hooks, and means for maintaining said guard rail in a second folded position in which said third side is positioned in a horizontal fashion on said horizontal surface of said platform, said first and second parallel sides being positioned exteriorly of and below said platform and said fourth side being journalled in a position which is at an angle of 270° from said second ends of said parallel sides.

4,520,899

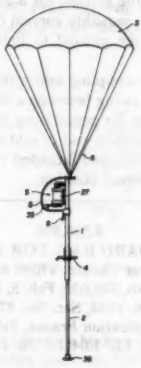
PARACHUTE APPARATUS WITH SHOCK ABSORBER

Tulio Vasquez, Carrera 15 No. 39-27, Bogotá , Colombia

Filed Apr. 22, 1983, Ser. No. 489,142

Int. Cl.³ A62B *1/00*; B64D *17/00*

U.S. Cl. 182—230 **17 Claims**



1. An apparatus for use in jumping from burning buildings or the like, comprising a parachute, restraining means for normally maintaining said parachute in a compact folded condition, first support means for said parachute mounted on said apparatus, means which continue to connect said parachute to said first support means when said restraining means has been released and said parachute has opened, a shock absorber means,

said shock absorber means comprising an outer and an inner tubular member telescopically movable with respect to each other from a retracted position corresponding to the storage position of said apparatus to an elongated extended position corresponding to the in-use position of said apparatus, person support means carried by said apparatus at a level below the level at which said parachute is connected to said first support means, first actuator means for causing the release of said restraining means to permit opening of said parachute to its in-use condition, second actuator means for causing said outer and said inner tubular members to move relative to each other from their retracted position to their extended in-use position, and means for substantially simultaneously actuating said first and said second actuator means to cause movement of said parachute to open condition and to cause said relative movement of said tubular members to said extended position.

4,520,900

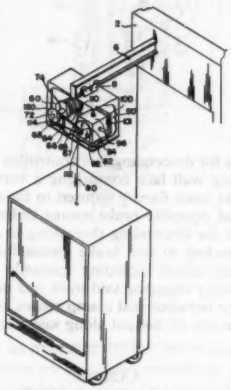
FIRE ESCAPE APPARATUS FOR USE IN HIGH-RISE BUILDINGS AND THE LIKE

Orey C. Orgeron, 706 Souvenir Gate, Lafayette, La. 70506

Continuation-in-part of Ser. No. 438,035, Nov. 1, 1982,. This application Mar. 21, 1983, Ser. No. 477,143

Int. Cl.³ A62B *1/02*

U.S. Cl. 182—238 **3 Claims**



1. Fire escape apparatus for facilitating the escape of victims entrapped in a burning high-rise building having a plurality of floors comprising:

a. a support device for carrying a plurality of persons;

b. a cable affixed to said support device extending into and wound upon a cable take-up drum;

c. a constant velocity braking means rotatably connected to said drum for controlling the speed of unwinding thereof, said braking means comprising a constant displacement hydraulic pump and a closed hydraulic conduit, having a flow restriction means and a hydraulic pressure regulating means for continuously circulating hydraulic fluid within the hydraulic conduit and said pump, wherein said constant displacement hydraulic pump is rotatably connected to said cable carrying drum, an outlet of said pump being fluidly connected to a flow restricting means, an outlet of said flow restricting means being fluidly connected to a hydraulic pressure regulating means, an outlet of said pressure regulating means being connected to an inlet of said pump, the entire being filled with a hydraulic fluid;

d. a housing enclosing said cable drum and braking means rotatably connected thereto;

e. a means for removing the aforesaid personnel support device from within the buiding to outside of the building;

f. a mechanical overdrive means rotatably connected to said cable carrying drum and to said braking means, said overdrive means further comprising a first sprocket means fixedly mounted on a shaft of said cable-carrying drum, a second sproket means having a diameter at least twice as small as that of said first sprocket means, fixedly mounted on the shaft of said hydraulic pump of said braking means and an endless chain mounted on first and second sprocket means to operatively connect said drum and said braking means;

g. said mechanical overdrive means and said constant velocity braking means in combination with said cable-carrying drum producing a decreasing descent velocity.

4,520,901

METHOD AND APPARATUS FOR DISPENSING A WORKING SUBSTANCE SUCH AS A LUBRICANT

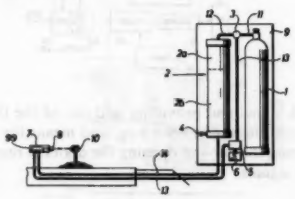
Alf L. Borup, Bromma, and Erik G. Aström, Järfälla, both of Sweden, assignors to Swedish Rail System AB SRS, Solna, Sweden

Filed Sep. 28, 1978, Ser. No. 946,923

Claims priority, application Sweden, Sep. 30, 1977, 7710965; Jul. 20, 1978, 7808021

Int. Cl.³ B61F *17/00*; F16N *7/00*

U.S. Cl. 184—3.1 **15 Claims**



1. A method of lubricating with grease a curved section of a railway track subjecting to wear by the wheel flanges of passing railway vehicles, comprising:

providing a lubricating metering unit at a distance from but adjacent to the inner side surface of a rail section to be lubricated; and, intermittently propelling a metered amount of grease from a generally horizontally directed nozzle of said metering unit in a shot-like fashion to the inner side surface of the rail section.

4,520,902

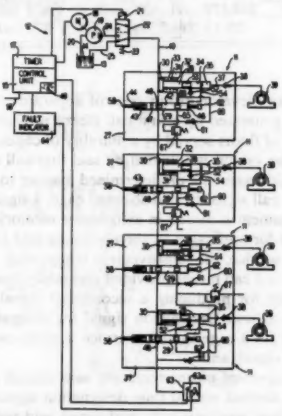
LUBRICANT APPLYING SYSTEM AND INJECTOR MEANS

John P. Snow, Sagamore Hills, Ohio, assignor to Lubriquip-Houdaille, Inc., Warrensville Heights, Ohio

Filed Apr. 19, 1983, Ser. No. 486,310

Int. Cl.³ F16N *25/00, 29/04*

U.S. Cl. 184—7.4 **18 Claims**



1. A lubricant applying system provided with at least one lubricant injector structure having means for lubricant delivery to at least one respective point of use, and comprising:

a lubricant supply and return passage means connected with said injector structure;

operating means at one end of said passage means functioning cyclically for in one phase supplying lubricant under predetermined pressure from a source through said passage means for sequentially discharging and recharging said injector structure, and for in a second phase and after said recharging permitting return of surplus lubricant from said injector structure in a sequential manner through said passage means to said source;

pressure sensing and signaling means connected to an opposite end of said passage means for monitoring pressure conditions in said passage means;

said at least one injector structure containing a lubricant displacement plunger and a lubricant metering plunger;

means normally biasing said displacement plunger toward one end;

a pressure responsive head on said one end of said displacement plunger for direct exposure to pressure in said passage means for effecting shifting of said displacement plunger in opposition to said biasing means in a lubricant displacement stroke toward its opposite end and into a lubricant displacement chamber at such end from which lubricant is thereby ejected through a port communicating with one of said points of use, the displacement plunger being then returned to said one end upon release of pressure in said passage means;

said injector structure including means completing a metering chamber in combination with one end of said metering plunger and adapted to be substantially occupied by the metering plunger in one operating mode of the metering plunger and to be vacated by the metering plunger in a second operating mode thereof;

said injector structure a passageway connecting said metering chamber with said displacement chamber;

means normally biasing said metering plunger into said one operating mode;

said metering plunger being adapted in said one operating mode for opening said lubricant passage means and by occupying said metering chamber driving lubricant from said metering chamber through said passageway into said displacement chamber, and being adapted in said second operating mode for closing said lubricant passage means and vacating said metering chamber in response to lubricant pressure in said metering chamber; and

said injector structure and said displacement plunger including metering chamber pressurizing and recharging means controlled by said displacement plunger for selectively effecting communication between said lubricant passage means and said passageway in the displacement stroke of said displacement plunger, so that lubricant under pressure will be charged into said metering chamber and cause said metering plunger to shift into said second operating mode and when pressure is released said metering plunger will be shifted into said first operating mode by its biasing means for thereby driving a charge of lubricant from said metering chamber through said passageway into said displacement chamber.

4,520,903

FORKLIFT VEHICLE

William Arnold, Sutton West, and Gerardus J. Brouwer, Keswick, both of Canada, assignors to Brouwer Turf Equipment Limited, Keswick, Canada

Division of Ser. No. 154,567, May 29, 1980, Pat. No. 4,365,921. This application Nov. 12, 1982, Ser. No. 441,055

Claims priority, application Canada, Jun. 21, 1979, 330327

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 R **2 Claims**

1. A self propelled forklift vehicle comprising:

(a) a frame, a fork tower mounted on said frame, and forks mounted on said fork tower,

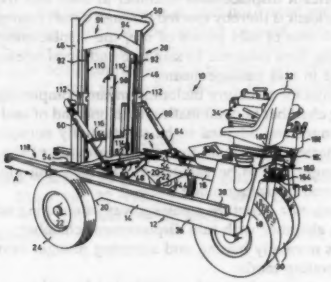
(b) front wheels connected to said frame adjacent the front thereof to support the front of said frame,

(c) said frame including a rear transverse frame member,

(d) yoke means pivotally mounted on said transverse frame

adjacent the rear of said frame for at least 180° rotary movement of said yoke means about a vertical axis, said yoke means being located substantially at the centre of said transverse frame member and extending below said transverse frame member,

(e) rear wheel means pivotally carried by said yoke means for pivotal movement of said rear wheel means about a substantially horizontal first axis, said rear wheel means including differential means pivotally carried by said yoke means for pivotal movement of said differential means about said first axis, said differential means having a pair of free ended axles projecting one from each side thereof and oriented along a substantially horizontal second axis located at rigth angles to said first axis, a pair of rear wheels one mounted on each said free ended axle, said rear wheels being spaced closely together and substantially centred transversely under said rear transverse frame member, thus permitting side to side tilting of said differential means and rear wheels about said first axis,



(f) vertical drive shaft means extending vertically downwardly through said yoke means and connected to said differential means for driving said axles, said vertical drive shaft means including a universal joint connection therein and a telescopic section therein, to permit said side to side tilting of said rear wheel means,

(g) a motor mounted on said frame and coupled to said vertical drive shaft means for driving said rear wheel means,

(h) steering means connected to said frame for rotating said yoke means to steer said vehicle,

(i) said motor being mounted on said rear transverse frame member on one side of said vertical drive shaft means and an operator seat being mounted on said rear transverse frame member on the other side of said vertical drive shaft means, whereby the weight of an operator on said seat constitutes a counterweight for the weight of said motor.

4,520,904

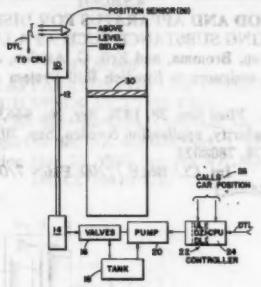
ELEVATOR LEVELING SIGNAL ERROR AND CORRECTION

David J. Rado, Granby, and Steven D. Coste, Torrington, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 9, 1983, Ser. No. 550,161
Int. Cl.³ B66B *1/40*
U.S. Cl. 187—29 R **3 Claims**

1. An elevator comprising a car, a car propulsion system, a car motion control for controlling the propulsion sysem, and a position indicator for providing indications of car position when the car is above a floor, below the floor, and near floor level, characterized in that:

the motion control comprises processing means responsive to indications of car position for providing a first signal when the car is above the floor level at a certain first distance, a second signal when the car is at the floor level, and a third signal when the car is below the floor level by a certain preset distance, for providing a fourth signal that manifests that one of the indications is incorrect as the car approaches a floor and for providing one of those three signals in response to said fourth signal, means for storing



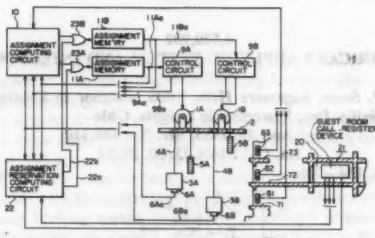
the fourth signal and providing said one of the three signals at each successive floor stop, and means for slowing and stopping the car and opening the doors in response to the three signals.

4,520,905

ELEVATOR GROUP CONTROL APPARATUS

Isao Sasao, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,784
Claims priority, application Japan, Mar. 9, 1983, 58-39623
Int. Cl.³ B66B *1/18*
U.S. Cl. 187—29 R **12 Claims**



1. In an elevator group control apparatus in which a call signal is generated by a first call means provided at each of a plurality of floors served by a plurality of cages, an assignment computing circuit is actuated by said first call signal to select one of said cages in a predetermined manner to thereby assign said first call signal to said selected cage, a signal representing the assignment is stored in assignment memories respectively provided for said cages to thereby cause said selected cage to perform service, the improvement comprising:

(a) second call means provided separately from said first call means for producing a second call signal and a desired arrival time designation signal for designating a desired time for a cage to make service in response to the second call signal; and

(b) assignment means receiving said second call signal and said desired arrival time designation signal for determining how service is to be performed, said assignment means comprising means for computing estimated arrival times required for each of said cages to respond to said second call signal, means for comparing the computed estimated arrival times with said desired time to thereby perform said selecting operation, and means for transmitting an

assignment signal obtained as a result of comparison to corresponding ones of said memories;

wherein said assignment means comprises means for selecting one of said cages for which said estimated arrival time is longer than and closest to said desired time thereof so that the first call signal takes priority over the second call signal.

4,520,906

CONTROL APPARATUS FOR ELEVATOR

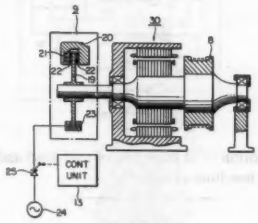
Eiki Watanabe, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 3, 1984, Ser. No. 627,653

Claims priority, application Japan, Jul. 6, 1983, 58-122615

Int. Cl.³ B66B *1/32*

U.S. Cl. 187—29 R **15 Claims**



1. A control apparatus for an elevator wherein a cage is driven by a hoisting machine having an electric motor which is driven by A.C. electric power; comprising loss impartation means to impart a loss to the hoisting machine of the cage and being capable of adjusting the loss; cage position detection means to detect the position of the cage; and control means to control said loss impartation means on the basis of an output signal of said cage position detection means so as to adjust the loss in accordance with the position of the cage.

4,520,907

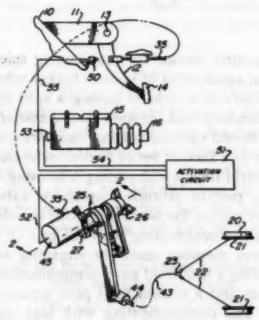
MECHANICAL-EMERGENCY SYSTEM BETWEEN VEHICLE SERVICE BRAKE FOOT PEDAL AND PARKING BRAKE

Joseph G. Sikora, R.D. #3, Box 218, Pottstown, Pa. 19464

Filed Mar. 10, 1983, Ser. No. 473,968

Int. Cl.³ F16D *65/36*; B60T *13/02*

U.S. Cl. 188—156 **2 Claims**



1. A normally quiescent automatically energized manually controlled emergency brake system for a vehicle having a service brake operator and a parking brake apparatus, said system comprising a mounting shaft, an actuator rotatably mounted on said shaft and conncted to said service brake operator for back and forth angular movement along a path corresponding to movement of said operator, a follower rotatably mounted on said shaft independently of and adjacent to said actuator for movement longitudinally of said shaft toward and away from said actuator into and out of said path transversely thereof and along said path in following relation with said actuator, follower connection means connecting said follower to said parking brake apparatus for operating the latter upon movement in said following relation, resiliently yieldable holding means operatively connected to said follower to urge said follower longitudinally of said shaft and normally maintain said follower away from said actuator in position out of said path, sensor means for sensing abnormal service brake operator functioning, activator means responsive to said sensor means to urge said follower longitudinally of said shaft against said holding means and into said path and said following relation to operate said parking brake system upon failure of said service brake, and limit means operative upon predetermined yielding of said holding means to limit the restoration thereof and maintain said follower in said following relation.

4,520,908

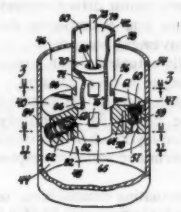
PRESSURE BALANCED VALVE FOR ADJUSTABLE HYDRAULIC DAMPER

Keith H. Carpenter, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1983, Ser. No. 550,564

Int. Cl.³ F16F *9/50, 9/46*

U.S. Cl. 188—319 **3 Claims**



1. In an adjustable hydraulic damper including a piston and rod assembly slidably disposed in a fluid filled cylinder tube and defining therewith inversely variable volume compression and rebound chambers on opposite sides of said assembly and further including at least two relief valve means on said assembly operative to pass fluid to one of said compression and said rebound chambers when respective pressures on said relief valve means exceed corresponding ones of a pair of predetermined relief pressures, the combination comprising, means defining a cylindrical bore in said assembly, first passage means through said assembly between said bore and the other of said compression and said rebound chambers, second passage means between said bore and each of said relief valve means, a hollow right cylindrical valve spool in said bore movable between at least two control positions corresponding to pressure relief at each of said predetermined relief pressures, tube means on said spool extending axially therethrough and open to said one chamber operative to equalize pressure on opposite ends of said spool for axial pressure balance, a first plurality of circumferentially symmetrically arrayed upper ports through said spool intermediate its ends registerable with said first passage means in each of said spool control positions to admit fluid from said other chamber to said spool, a second plurality of circumferentially symmetrically arrayed ports through said spool intermediate its ends selectively registerable with respective ones of said second passage means in respective ones of said spool control positions for directing fluid to corresponding ones of said relief valve means thereby to effect selective pressure relief of said other chamber at either of said predeter-

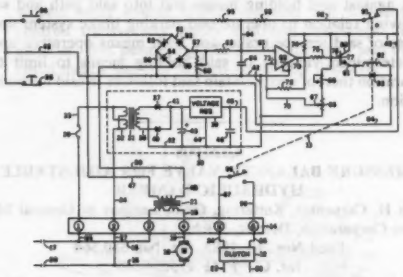
mined relief pressure levels, the circumferential symmetry of said upper and said lower ports effecting internal radial pressure balance on said spool, and control means connected to said valve spool operative to move said valve spool between said control positions.

4,520,909

CLUTCH ACTUATOR

Carl T. Brewer, 334 Lyonnais, Creve Coeur, Mo. 63141

Filed Dec. 16, 1981, Ser. No. 331,321
Int. Cl.³ B60K *41/02*
U.S. Cl. 192—0.02 R **10 Claims**



1. In an improved motor driven conveyor system including an electrical motor and a conveyor driven by the motor, wherein the improvement comprises:

(a) an electrically actuated clutch interconnecting the motor and the conveyor in drive relation,

(b) clutch-actuating means, responsive to motor current for actuating the clutch for selectively disconnecting the motor and conveyor when the motor current is greater than a predetermined value corresponding to motor overload,

(c) the clutch-actuating means being selectively adjustable for setting said predetermined value,

(d) the clutch-actuating means including manually actuated means for selectively actuating the clutch for disconnecting the motor from the conveyor and for selectively actuating the clutch for connecting the motor to the conveyor,

(e) the clutch-actuating means including means for comparing the motor current with a reference signal, and

(f) the clutch-actuating means including means for generating the reference signal from the line voltage supplied to the motor.

4,520,910

GRINDING MILL CONTROL USING CONTROLLED PULSING OF AIR CLUTCHES

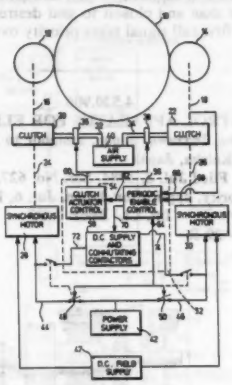
Peter deHertel Eastcott, and Ronald C. Trussler, both of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Dec. 9, 1982, Ser. No. 448,319
Int. Cl.³ B60K *41/02*; F16H *37/06*
U.S. Cl. 192—0.02 R **6 Claims**

1. A control means for stopping motion of a drive system having a large load driven by one or more dynamoelectric machines powered from an electrical source and coupled to said load through respective dry clutches, said control means comprising

clutch actuating means responsive to removal of the electrical source from said machines for applying for a predetermined duration of time a predetermined amount of pressure to said clutches sufficient to at least partially close said clutches but insufficient to fully close and lock-up said clutches, and

enabling means for periodically enabling said clutch actuating means to periodically apply said predetermined amount of pressure for said predetermined time duration



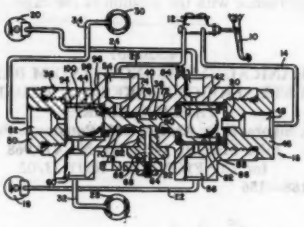
until the motion of at least one of said load and said dynamoelectric machine ceases.

4,520,911

VEHICLE ATTITUDE RESPONSIVE BRAKE CONTROL DEVICE

Robert F. Gaiser, Stevensville, Mich., assignor to Allied Corporation, Morristown, N.J.

Filed Aug. 23, 1982, Ser. No. 410,731
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—13 A **17 Claims**



1. A brake control device for maintaining selectively and automatically an application of vehicle brakes when the vehicle is on an incline, in a vehicle having a split system brake circuit communicating fluid pressure from a master cylinder to one set of brakes and communicating fluid pressure from the master cylinder to a second set of brakes independent of said one set, the control device comprising a housing with a bore therethrough, a pair of attitude responsive valve members movably carried within the bore, a control member disposed within the bore and cooperating with the pair of valve members, said control member sealingly engaging said bore to substantially define a first fluid path communicating with said one set of brakes and a second fluid path separate from said first fluid path and communicating with said second set of brakes, and an actuator extending into the bore of the housing and engageable with the control member, the control member being movable by said actuator from a rest position wherein said pair of valve members provides open communication between said master cylinder and said brake sets to an operable position wherein said pair of attitude responsive valve members may be displaced responsively to vehicle attitude to close

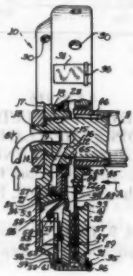
fluid communication in one direction from said brake sets to said master cylinder via said fluid paths in order to maintain said application of the vehicle brakes.

4,520,912

HYDRAULICALLY ACTUATED STARTING CLUTCH ASSEMBLY

Ernest A. Ferris, Oak Brook, and John W. McColl, Broadview, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 18, 1982, Ser. No. 434,807
Int. Cl.³ F16D *25/064, 25/14*
U.S. Cl. 192—85 AA **9 Claims**



1. A starting clutch for a continuously variable transmission adapted to engage upon a signal from a throttle induced system oil pressure to couple a driving shaft with a driven concentric sleeve shaft, comprising a hub operatively connected to rotate with the continuously rotating driving shaft, a clutch cover secured to said hub and having an axial flange portion, said hub having an annular pressure chamber formed therein receiving an axially reciprocable piston, a clutch plate carrying friction facings, a second hub operatively connected to the sleeve shaft and secured to the clutch plate, an end plate operatively connected to said axial flange portion, an axially reciprocable pressure plate operatively connected to rotate with said axial flange portion, a Belleville spring pivotally mounted in said cover and actuated by said piston to engage said pressure plate and urge it against the clutch plate located between the pressure plate and end plate, said Belleville spring having a plurality of inwardly extending fingers separated by generally radial slots, a source of hydraulic pressure communicating with said pressure chamber, and a plurality of centrifugal weights received in at least some of the slots to counterbalance the centrifugal force of the hydraulic fluid in the pressure chamber.

4,520,913

DEVICE FOR SELECTIVELY SEPARATING AND CONNECTING A ROTATABLE SHAFT

Paul Maucher, Sasbach, and Oswald Friedmann, Lichtenau, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 143,935, Apr. 24, 1980,. This application Aug. 5, 1982, Ser. No. 405,402
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917137
The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.
Int. Cl.³ F16D *13/44, 21/00*
U.S. Cl. 192—48.8 **43 Claims**

1. Device for selectively connecting and separating the flywheel assembly of a friction clutch to and from a rotatable shaft, such as the crankshaft of an internal combustion engine, comprising a bearing in which the flywheel assembly is rotatable relative to the shaft, a friction plate having first friction surfaces disposed at the opposite sides thereof, means for non-rotatably connecting said friction plate to the shaft, two pressure plates forming part of the flywheel assembly and each having a second friction surface adjacent to one of said first friction surfaces, said pressure plates being axially movably but non-rotatably connected to each other and one of said pressure plates being connected to said bearing against axial movement with reference thereto, means for moving the other of said pressure plates axially, means disposed between the shaft and said first friction surfaces for yieldably biasing said friction

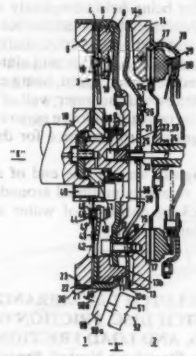


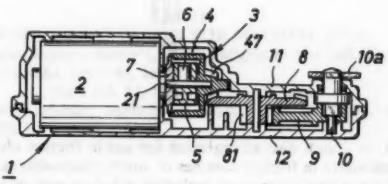
plate axially in a direction away from said one pressure plate, said biasing means being elastic, as considered in the axial direction of said flywheel assembly, and being affixed to the shaft and to said friction plate so that the centers of said first friction surfaces are located on the axis of the shaft, means for holding said biasing means against rotation with reference to said friction plate, and stop means for limiting the extent of axial movement of said first friction surfaces.

4,520,914

CENTRIFUGAL CLUTCH WITH RADIALLY MOVABLE MAGNETIC MEMBER

Tsutomu Kagiyama, and Tatsuyuki Takaishi, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Kanagawa, Japan

Filed May 7, 1982, Ser. No. 376,212
Claims priority, application Japan, May 9, 1981, 56-66905[U]
Int. Cl.³ F16D *43/16, 27/01;* E05C *13/04*
U.S. Cl. 192—71 **2 Claims**



1. An actuator with a centrifugal positive clutch, comprising, in combination:

an outer casing having a cover plate;

a rotary drive shaft made of magnetic material;

a clutch drum of non-magnetic material, said clutch drum being loosely rotatably mounted around said drive shaft, having a large inner diameter portion, having at least one engaging protuberance projecting inwardly from said large inner diameter portion, and having a bevel gear and an axial projection formed integrally at a rear wall of the

clutch drum, said axial projection being supported by the cover plate;

a clutch body of non-magnetic material loosely rotatably mounted within said clutch drum and mounted on said rotary drive shaft for being driven by said rotary drive shaft, said clutch body having a retaining hole extending radially from the center thereof toward the inner wall of said clutch drum;

an engaging permanent magnet freely loosely movable in said retaining hole, said engaging permanent magnet having a length for being held completely within said retaining hole by the magnetic attraction between said permanent magnet and said rotary drive shaft when said clutch body is at a standstill and, when said clutch body is rotated faster than predetermined speed, being caused to protrude from said hole toward the inner wall of said clutch drum due soley to the centrifugal force generated and to engage with said engaging protuberance for driving said clutch drum; and

a lid member tightly sealing one end of said clutch drum, being loosely rotatably mounted around said rotary drive shaft for blocking entrance of water and dust into the centrifugal clutch.

4,520,915

MULTISTAGE CLUTCH DISC ARRANGEMENT WITH DISHED CLUTCH DISC, FRICTION GENERATING MEANS, AND LOAD FRICTION UNIT

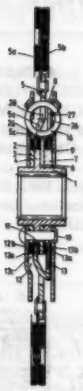
Jean-Claude Strub, Strassburg-Neuhof, France, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 396,137

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3126695

Int. Cl.³ F16D *3/14, 3/66*

U.S. Cl. 192—106.2 **27 Claims**



1. A clutch disc arrangement for use in friction clutches, particularly in friction clutches of automotive vehicles, comprising a first component including a hub, a pair of spaced apart guides rotatable with said hub and a partition rigid with said hub; a second component including a clutch disc disposed between said guides and rotatable within limits relative to said first component from a neutral position; first energy storing means interposed between said components to yieldably resist rotation of said clutch disc from said neutral position; at least one first friction generating means interposed between said components to resist at least some first stages of rotation of said clutch disc from said neutral position; and a load friction unit interposed between said components to resist predetermined advanced stages of rotation of said clutch disc from said neutral position and to resist at least one of said first stages jointly with said first friction generating means, said load friction unit including at least one friction disc between said clutch disc and one of said guides, at least one second friction generating means interposed between said friction disc and first component, and second energy storing means disposed outwardly of said partition, as considered in the radial direction of said hub, and interposed between said friction disc and at least one of said guides to yieldably oppose rotation of said clutch disc relative to said first component during a predetermined stage of rotation of said clutch disc from said neutral position, said clutch disc and said first friction generating means being disposed at one side and said friction disc and said second friction generating means being disposed at the other side of said partition, as considered in the axial direction of said hub.

4,520,916

CLUTCH DISC ASSEMBLY INCLUDING A FLANGE ON THE CLUTCH DISC, THE FLANGE EXTENDING THROUGH ONE GUIDE PLATE AND A FRICTION DISC

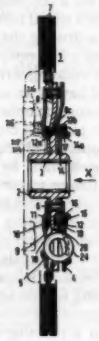
Jean-Claude Strub, Strassburg-Neuhof, France, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,615

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136600

Int. Cl.³ F16D *3/14, 3/66*

U.S. Cl. 192—106.2 **36 Claims**

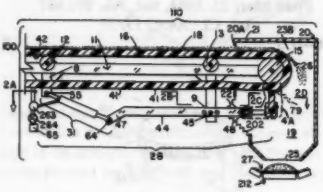


1. A clutch disc assembly, particularly for use in in the clutches of automotive vehicles, comprising a first component including a hub and two spaced apart guides rotatable with the hub; a second component including a clutch disc disposed between said guides and rotatable within limits relative to said first component; first energy storing means interposed between said components to yieldably resist at least some stages of rotation of said clutch disc relative to said first component from a neutral position; and means for yieldably opposing advanced stages of rotation of said clutch disc from said neutral position, comprising at least one friction disc, friction generating means acting between said friction disc and said first component, and second energy storing means interposed between said friction disc and said first component, said clutch disc comprising means for regulating the operation of said friction generating means in cooperation with said friction disc and for limiting the extent of angular displacement of said clutch disc relative to said first component, said regulating means comprising at least one projection provided on said clutch disc, one of said guides and said friction disc having a cutout for said projection.

4,520,917
CONVEYOR BELT CLEANING METHODS AND APPARATUSES THEREFOR

Bob Sillivent, and Clifford Sillivent, both of Amarillo, Tex., assignors to Thomas J. Wright, Alburqueque, N. Mex. and Mike L. Burns, Amarillo, Tex.

Filed Mar. 3, 1982, Ser. No. 354,298
Int. Cl.³ B65G *45/00*
U.S. Cl. 198—499 **6 Claims**



1. In combination, a conveyer belt assembly and an electrically conductive exterior belt surface scraper assembly, said conveyor belt assembly comprising a rigid conveyor belt assembly frame, a series of like upper sets of idler rollers, lower idler rollers and a drive roller,

each upper set of rollers comprising a horizontally extending central lower transverse roller and, laterally thereof, rollers extending transversely to the length of the belt which lateral rollers are at an angle to the horizontal portions of the belt,

a lower, interior, surface of an upper run of said conveyer belt on top of the upper set of rollers, said upper run carrying particulate material toward a drive roller and said belt contacting and curving around said drive roller at a front portion of said belt,

a return lower path of said belt extending from the drive pulley to a driven pulley and the exterior lower surface of the belt then riding on idler rollers,

said exterior belt surface scraper assembly comprising a belt scraper control arm sub-assembly, a blade sub-assembly, and a piston sub-assembly,

said sub-assemblies attached to said conveyer belt assembly frame, said control arm sub-assembly comprising a pair of like rigid arms, each pivotally connected at a pivotal support on said frame,

each said arm formed of a first straight solid central rigid electrically conductive portion and a forwardly extending sleeve portion extending horizontally forwardly of said first portion, the rear portion of each of the arms connected to said piston sub-assembly,

said piston sub-assembly comprising a pair of like pistons each having a rear pivotal support and an extensible piston arm, one end of said piston arm pivotally connected at a front pivot fixed to a rear portion of the adjacent arm,

a pneumatic connector conduit hose operatively joining an interior chamber of said pistons to a conventional connector which is releasably connected to a source of air pressure,

said blade sub-assembly comprising a flexible flat surfaced scraper blade and a rigid blade bracket support, said scraper blade held by said bracket support and extending transversely to the length of said belt,

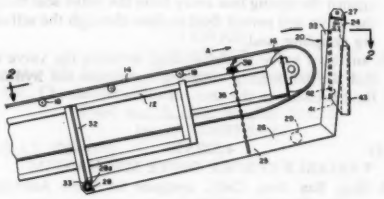
whereby said belt scraper blade is held by the control arm sub-assembly and the rear end of each of the pair of arms connects to and is movable by said piston subassembly and each of the arms is pivotally held at a bearing which is in fixed spatial relationship to the frame of the conveyer belt assembly and said belt,

and said upper edge of the scraper blade matches the exterior contour of the belt on the drive roller and is the edge of a solid prismatic piece of plastic and said upper edge of blade is, in its operative position, positioned at a location on the exterior belt surface which is vertically below the center of an axle of said drive roller, said blade edge being softer than said belt and electrically conductive and insoluble in oil, and wherein, rigid steel plugs are rigidly and firmly connected to the rear of bracket, each plug having a plurality of longitudinally spaced apart transverse holes therein and holes therefor in the arm sleeve portions whereby to allow for longitudinal adjustment of the blade relative to the spatially fixedly located supports for said arms.

4,520,918
METHOD OF AND APPARATUS FOR PREVENTING SEGREGATION OF AGGREGATE

Joe R. Ray, San Jose, Calif., assignor to Noble Automated Systems, Inc., San Jose, Calif.

Filed Aug. 12, 1982, Ser. No. 407,453
Int. Cl.³ B65G *31/00*
U.S. Cl. 198—640 **7 Claims**



1. Apparatus for preventing separation of different size particles from a mix of aggregate of various size particles as it is discharged from the end of a conveyor comprising a generally upright aggregate intercepting and confining member, and mounting means for mounting said intercepting member adjacent the discharge end of a conveyor, said member comprising a plurality of vertically extending channels disposed side-by-side facing the end of the conveyor, said channels being arranged generally in a square-wave configuration in transverse cross-section, said channels being formed from generally upright rear wall means for intercepting aggregate moving in a first direction away from the end of the conveyor and vertically elongated generally upright side wall means for preventing movement of particles of aggregate laterally of said first direction, said rear wall and side wall means being arranged to guide aggregate directly downwardly in a pile, said member being disposed a selected spaced distance from said discharge end of said conveyor to intercept the aggregate before larger particles separate from smaller particles.

4,520,919
WORK-CLAMP PALLET FOR MACHINE TOOL

Yonezawa Keitaro, Itamishi, Japan, assignor to Aioi Seiki Kabushiki Kaisha, Itamishi, Japan

Filed Jul. 12, 1982, Ser. No. 397,246
Claims priority, application Japan, Jul. 21, 1981, 56-108998[U]
Int. Cl.³ B65G *49/00*
U.S. Cl. 198—648 **15 Claims**

1. A work clamp pallet for a machine tool comprising:

a. a base block having means on a lower surface for attachment to a bed of a machine tool;

b. a plurality of hydraulically activated work clamping devices attached to the base block such that a plurality of workpieces may be mounted on the base block;

c. hydraulic fluid conduit means attached to the base block and interconnecting the work clamping devices;

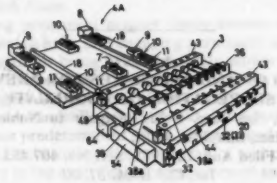
d. a hydraulic fluid pressure source;

e. self-sealing coupling means for attaching the hydraulic fluid pressure source to the fluid conduit means; and,

f. a shut-off valve attached to the base block and interposed

between the self-sealing coupling means and the fluid conduit means, the valve having:

i. a valve core element biased against a valve seat to close the valve and prevent decline of the hydraulic fluid pressure in the work clamping devices and the fluid conduit means;



ii. valve operating means to move the valve core element against the spring bias away from the valve seat to open the valve and permit fluid to flow through the self-sealing coupling; and,

iii. auxiliary valve means located between the valve seat and the self-sealing coupling to release the hydraulic fluid pressure in the shut-off valve.

4,520,920

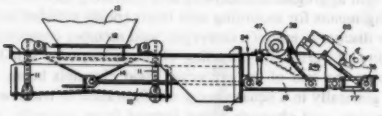
VARIABLE STROKE DRIVE MECHANISM

Joe R. Ray, San Jose, Calif., assignor to Noble Automated Systems, Inc., San Jose, Calif.

Filed Oct. 7, 1982, Ser. No. 433,227

Int. Cl.³ B65G *27/00*

U.S. Cl. 198—761 **3 Claims**



1. Apparatus for controlling the rate of discharge of material comprising:

(a) a feeder pan;

(b) means supporting said feeder pan for reciprocating movement;

(c) pan drive means having a pan drive member and a connecting rod connected to said feeder pan for imparting a reciprocating movement to said feeder pan through a range of movement, said pan drive member having an end section;

(d) motor drive means connected to said pan drive means for imparting a reciprocating movement to said pan drive member and said connecting rod; and

(e) control means having an adjusting arm pivotally connected to said end section of said pan drive member at a pivot axis, said control means comprising a pivot frame for controlling the angular position of said adjusting arm about said pivot axis relative to the direction of travel of said reciprocating movement of said pan drive member and said connecting rod, said end section of said pan drive member being movable over an arcuate path during the reciprocation of said pan drive member and said connecting rod, and means for pivoting said pivot frame for varying the angular position of said adjusting arm, pivotal movement of said pivot frame to vary the angular position of said adjusting arm moves the center of the circle of the arcuate path along which said end section travels to control the extent of reciprocating movement of said pan drive member and said connecting rod, whereby the positioning of said adjusting arm co-extensive with said pan drive member and said connecting rod results in minimum reciprocation of said feeder pan and the positioning of said adjusting arm at an angle relative to the direction of travel of said reciprocating movement of said pan drive member and said connecting rod results in an increased reciprocating movement for said feeder pan.

4,520,921

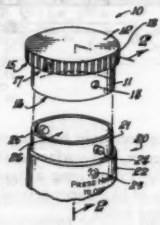
METHOD AND APPARATUS FOR CLOSING CYLINDRICAL CONTAINERS

Ellin D. Vissing, P.O. Box 437, Idaho Falls, Id. 83401

Filed Mar. 23, 1984, Ser. No. 592,887

Int. Cl.³ A45C *13/10*

U.S. Cl. 206—1.5 **2 Claims**



1. A container for pharmaceuticals and the like comprising in combination:

a first cylindrical member having one end closed and one end open formed of a deformable material, and having a portion of said first cylindrical member adjacent its open end with a reduced wall thickness compared to the balance of the wall thickness of said first cylindrical member, a boss extending outwardly a distance from one position on said reduced thickness;

a second cylindrical member having a closed end with an enlarged flange and an open end, said cylindrical member being formed of a deformable material, and the interior dimension on said second cylindrical member being suitable to receive the reduced thickness portion of said first cylindrical member, and having an opening in its cylindrical wall suitable to accommodate the boss on said first cylindrical member, and wherein said second cylindrical member has a spiraling and tapering ramp extending from the outer edge adjacent the open end of said second cylindrical member but on the interior thereof to an interconnection with said opening in such manner that the boss on the first cylindrical member may be engaged within said ramp and by twisting the said second cylindrical member about the first cylindrical member the boss will ride up the ramp and snap into position within the opening in said second cylindrical member.

4,520,922

CONTAINER FOR FLAT ARTICLES

Edward B. Beach, 5112 Williamsburg Blvd., Arlington, Va. 22207

Filed Jun. 25, 1984, Ser. No. 623,936

Int. Cl.³ B65D *5/44, 5/34*

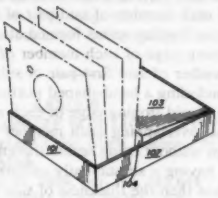
U.S. Cl. 206—44 R **20 Claims**

1. A shipping and storage container for shipping and storing flat articles said container formed from foldable material and capable of being convertible to a display stand comprising

a. a bottom wall having opposing, upright front and rear walls extending upwardly from said bottom wall and having opposing, upright side walls extending upwardly from said bottom wall, and

b. a top wall covering the container comprising a front section and a rear section said front section being hingedly attached to said rear section at longitudinal score lines,

whereby said container being convertible to a display stand by folding down said top front wall section along said score lines to form a wall substantially upright with respect to the bottom wall and spaced rearwardly of said front wall a distance sufficient to support all the flat contents in an upright position in a well formed between the newly formed upright wall and said front wall.



4,520,923

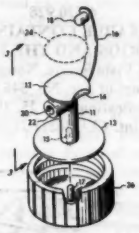
CONTACT LENS HOLDER

Fred Waldman, 8929 E. Jewell Cir., Denver, Colo. 80231

Continuation-in-part of Ser. No. 396,233, Jul. 8, 1982. This application Feb. 29, 1984, Ser. No. 584,557

Int. Cl.³ A45C *11/04*

U.S. Cl. 206—5.1 **6 Claims**



1. A contact lens holder comprising a stem terminating on one end in means for attaching the stem to the underside of a cap to a case for storing contact lens soaking solution and terminating on the other end in a dome, free of any surrounding sidewall, said dome having one or more cut out sections in its sides for exposing the underside rim of a contact lens positioned on said dome, and having a hinged strap, having a width less than the width of the dome, said strap being further provided with a connecting means for detachably connecting with a receiver means positioned on the side of the dome opposite the side to which the hinged strap is attached.

4,520,924

MULTI-PACKAGE AND PACKAGING DEVICE

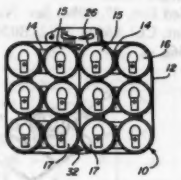
Bryant Edwards, Clarendon Hills; M. Julius Klygis, Barrington, and Robert C. Olsen, Streamwood, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 27, 1984, Ser. No. 604,754

Int. Cl.³ B65D *85/62, 75/56*

U.S. Cl. 206—150 **9 Claims**

1. A multi-packaging device comprising a first integral resilient plastic strip formed as a continuous loop, an intermediate strip extending across said loop having opposite ends integral with said first strip, a juncture region at each end of the intermediate strip including a pair of diverging strap segments each extending generally diagonally between the intermediate strip and the first integral resilient strip wherein a plurality of arrays of containers may be positioned within said first strip with the intermediate strip positioned therebetween so that the strap segments resiliently engage the corner regions of an associated array.



4,520,925

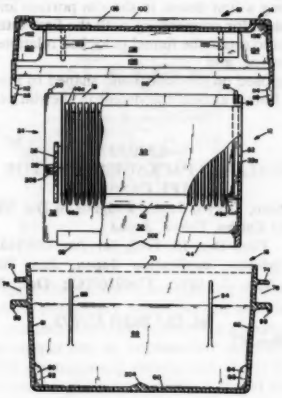
PACKAGE

Douglas M. Johnson, Chanhassen, Minn., assignor to Empak Inc., Chanhassen, Minn.

Filed Aug. 9, 1983, Ser. No. 521,723

Int. Cl.³ B65D *85/48*

U.S. Cl. 206—334 **15 Claims**



15. Package comprising:

a. package bottom including a flat bottom member, four slightly angled sides, an edge groove surrounding said sides, hook catches with finger holes on ends of said opposing end sides, internal vertical end guides and end internal side guides about said sides; and,

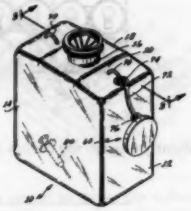
b. package top including a top horizontal member, four angled sides surrounding said top, a tongue lip for encompassing said grooved edge about a lower edge of each side opposing latches at ends of said top extending downwardly and a finger hole in each of said latches, opposing flexible longitudinal members for mating with each wafer, positioning vertical end and side angled members extending outwardly from interior of said sides and said ends for positioning of said cassette, and a recessed top surface in said top horizontal member whereby said package top tongue lip engages about and into said package edge groove, and said latches engage over said catches ends between said top and bottom packages respectively, thereby providing secure and contamination-free environment for transportation and storage.

4,520,926

CONTAINER FOR SHARPS

Ralph E. Nelson, Newport Beach, Calif., assignor to Winfield Corp., San Diego, Calif.

Filed Feb. 27, 1984, Ser. No. 583,599
Int. Cl.[3] A61M *5/32*; B02C *19/12*
U.S. Cl. 206—366 30 Claims



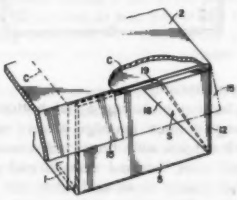
1. In combination for storing sharp objects,
a container for holding sharp objects, the container being made from a plastic material having properties that are heat resistant to autoclaving heat,
the container having a rim portion,
a funnel disposed on the rim portion of the container cover and having a central opening and a plurality of slits extending to the central opening,
there being a first detent in the rim portion and a detent in the funnel for cooperating with the first detent in the rim portion to retain the funnel in locked relationship with the rim portion, and
a cap disposed on the funnel and shaped to press the detent in the funnel against the detent in the rim portion.

4,520,927

HEAT-SEALABLE PACKAGE BLANK FOR A VIDEO TAPE CASSETTE

Yoshihiro Sato, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1982, Ser. No. 455,944
Claims priority, application Japan, Jan. 30, 1982, 57-10821[U]; Apr. 7, 1982, 57-49369[U]; Oct. 5, 1982, 57-151220[U]
Int. Cl.[3] B65D *85/672*
U.S. Cl. 206—387 1 Claim



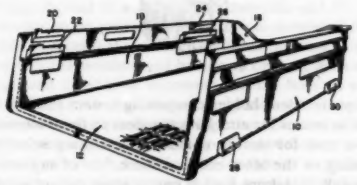
1. A container for a prereceived video tape cassette formed from a single polypropylene sheet having surface layers of heat-sealable nature, said container comprising:
a backstrip;
first and second panels disposed on opposite sides of said backstrip and folded into a right-angle relation with said backstrip and into a parallel relation with each other;
a pair of substantially triangular back flaps disposed between said first and second panels, extending from said backstrip, and folded into a right-angle relation with said backstrip and said panels and each member of said pair of back flaps further comprising a sloping edge along one side adjacent said first panel and a recess disposed along another side adjacent said second panel;
a first pair of side flaps disposed between said first and second panels, extending from opposite sides of said first panel, and folded into a right-angle relation with said first panel, each member of said first pair of side flaps further comprising a sloping edge extending along said sloping edge of each member of said pair of back flaps;
partially overlapping seams formed at a joining location of said sloping edge of each member of said back flaps and each member of said first pair of side flaps, each of said seams including a band-shaped portion extending along a portion of said sloping edge of each member of said back flaps and overlapping each member of said first pair of side flaps without being sealed thereto, each band-shaped portion having a substantially uniform reduced thickness that is less than the thickness of said back flaps and each band-shaped portion terminating prior to the end of said sloping edge of each member of the back flaps adjoining the backstrip;
a second pair of side flaps defining a first surface disposed to overlie a second surface defined by said back flaps and said first pair of side flaps, said second pair of side flaps extending from opposite sides of said second panel and folded into a right-angle relation with said second panel; and
heat-sealed seams formed between first and second opposing surfaces of said first pair of side flaps, said back flaps and said second pair of side flaps whereby said overlapped seams prevent intrusion of heat into said container so as to protect said prereceived video tape cassette.

4,520,928

NESTABLE/STACKABLE CONTAINERS FOR BAKERY GOODS AND THE LIKE

James D. Wilson, 421 Vista Suerte, Newport Beach, Calif. 92660

Continuation-in-part of Ser. No. 546,822, Oct. 31, 1983, abandoned. This application Jan. 25, 1984, Ser. No. 573,695
Int. Cl.[3] B65D *21/04*
U.S. Cl. 206—505 4 Claims



1. A nestable/stackable container formed of molded plastic material and intended to be nested in other like containers and stacked on other like containers at three different levels, said container having first and second side walls, each of said side walls having a plurality of discrete integral upper stacking lugs formed on the inner surface thereof at spaced positions along the upper edge thereof, and each of said side walls having a plurality of discrete integral lower stacking feet formed on the outer surface thereof at spaced positions along the lower edge thereof, the lower stacking feet being positioned to be received on the upper stacking lugs of a like container when the two containers are stacked on one another at a first vertically aligned stacking level with the front and rear ends of both containers facing the same directions, each of said side walls having a plurality of further discrete intermediate integral stacking lugs formed on the inner surface thereof under respective ones of said upper stacking lugs and extending beyond the respective ends of the corresponding upper stacking lugs by a predetermined amount to receive the lower stacking feet of a like container when the containers are stacked on one another in a second vertically aligned stacking level with the front and rear ends of both containers facing in the same directions; and each of the side walls including a plurality of cut-outs posi-

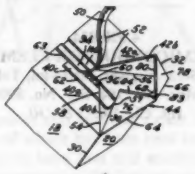
tioned below respective ones of the intermediate stacking lugs, and each cut-out having an inclined end portion extending beyond the corresponding intermediate stacking lug to permit an upper like container to be nested down into the first-named container at a third vertically aligned level with the lower stacking feet of the like container being received in respective ones of the cut-outs.

4,520,929

FLAT TOP END CLOSURE FOR LIQUID CONTAINER

Robert E. Lisiecki, Orchard Lake, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed May 31, 1984, Ser. No. 615,641
Int. Cl.³ B65D 3/20; B43M 7/00
U.S. Cl. 206—610 **2 Claims**



1. A blank for forming a flat top end closure for a liquid carrying, paperboard container, said blank comprising four side panels, first and second pairs of top closure panels alternately connected by respective horizontal score lines to the top edges of said four side panels as extensions thereof, said first pair of top closure panels each including a substantially triangular panel portion defined by converging diagonal score lines, and a pair of fold-back panels integrally connected to said substantially triangular panel portion at said diagonal score lines, said second pair of top closure panels including one shorter and one longer panel, a diagonal opening assist score line formed on each of said shorter and longer panels, a fold-over panel segment formed on the end of said shorter top closure panel, a reverse diagonal opening assist score line formed on said fold-over panel segment extending from an end of the adjacent diagonal opening assist score line, a lift tab formed on a side edge of said longer panel and extending past a portion of the adjacent fold-back panel, a perforated line extending across said longer top closure panel to the diagonal opening assist score line thereon aligned with an edge of said lift tab and the edge of said adjacent fold-back panel, and an extension formed on the fold-back panel adjacent said fold-over panel segment adapted to serve as an underlying segment for said perforated line when said blank is formed into a container.

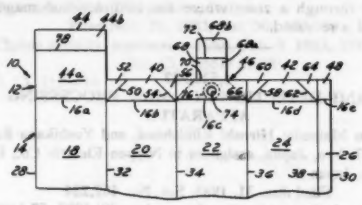
4,520,930

CONTAINER AND BLANK FOR CONSTRUCTING SAME

Robert E. Lisiecki, Orchard Lake, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed May 2, 1983, Ser. No. 490,767
Int. Cl.³ B65D 5/74
U.S. Cl. 206—628 **15 Claims**

1. In a thermoplastic coated blank for constructing a container, the blank including body panels including front and back panels and a pair of side panels; a side fold-in edge panel integrally connected to the top end of each of said pair of side panels; a front edge panel integrally connected to the top end of said front panel and including a fold-in segment and a fold-out segment, said fold-in and fold-out segments being interconnected by a weakened line, and a score line formed across the width of said fold-out segment at a distance away from said weakened line equal to the height of said fold-in panel segment; a cover panel integrally connected to said back panel; a diagonal score line formed on each of said side fold-in edge panels at the end thereof away from said front edge panel; and an additional diagonal score line formed on one of said front fold-in panel segment or said adjacent side fold-in edge panels; the



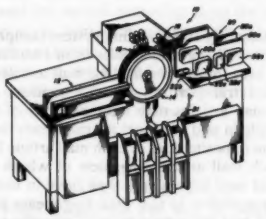
improvement comprising: said height of said front fold-in panel segment being sufficient to form an opening means therein, and an opening means formed therein.

4,520,931

APPARATUS FOR REORIENTING ELECTRICALLY ASYMMETRICAL AXIAL LEAD DEVICES IN A SORTER/TESTER

Jean Evain, Framingham, Mass., assignor to Daymarc Corporation, Waltham, Mass.

Filed Aug. 18, 1983, Ser. No. 524,413
Int. Cl.³ B65G 47/24; B07C 5/344
U.S. Cl. 209—542 **11 Claims**



1. Orienting apparatus for use in conjunction with apparatus that tests and sorts electrically asymmetrical, axial lead electronic devices, said test/sort apparatus having a magnetic input bin, a magnetic output bin, an intermediate magnetic carrier wheel, means for electronically testing each of the devices as they are carried on the outer circumference of said wheel, and means for stripping said devices from said wheel after said testing at one of several preselected circumferential locations in response to the results of said test, said devices being aligned generally in the same physical orientation while in said test-/sort apparatus, but having a random electrical orientation in said input bin and on said carrier wheel, said orienting apparatus comprising

means for creating a bi-directional magnetic field in said magnetic output bin to produce an upper bin region and a lower bin region with oppositely directed magnetic fields, a first one of said stripper means operating to direct devices to said upper bin region and a second one of said stripper means operating to direct said devices to said lower bin region,

means mounted in said output bin for transporting said devices in said upper bin region to said lower bin region, said transporting means including a plurality of means for holding one of said devices, said holding means being mounted on said transporting means for free rotation through at least 180° between positions where the devices are aligned with said magnetic fields,

orientation magnet means mounted on each of said holding means to align said holding means and the device carried on the associated holder with said magnetic fields, said

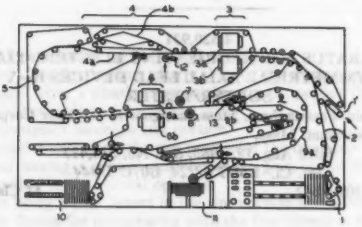
orientation magnet means reversing the alignment of the associated one of said holding means as said transporting means carries it from one of said bin regions to the other and through a zone where the bi-directional magnetic field is reversed.

4,520,932

STAMP DETECTION IN A MAIL PROCESSING APPARATUS

Yoshihiro Matsuda; Hiroshi Kimishima, and Yoshikazu Kado, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1983, Ser. No. 462,224
Claims priority, application Japan, Jan. 29, 1982, 57-13462
Int. Cl.³ B07C 5/342
U.S. Cl. 209—545 15 Claims



4. A stamp detecting and orienting system comprising transport means for conveying mail articles from a source to at least one collection area, means for feeding mail articles from said source into said transport means with random orientation whereby said mail articles may have any one of four initial orientations while in said transport means, means for detecting luminescence on opposite sides of each mail article for locating a stamp on each mail article regardless of which one of the orientations said mail article may then have in said transport means, means responsive to said detecting means for comparing the levels of said luminescence from opposite sides of said mail article, and control means responsive to said comparing means finding a signal having a higher level from a location on one side of said mail article for operating said system to uniquely process the mail article according to the orientation of said mail article which is indicated by said higher level signal.

4,520,933

DEVICE FOR STACKING CUT PLATES IN PLATE SHEARS

Harro Reiff, Leipheim, Fed. Rep. of Germany, assignor to Karl Mengele & Söhne, Günzburg, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,143
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114718
Int. Cl.³ B07C 5/36
U.S. Cl. 209—606 8 Claims

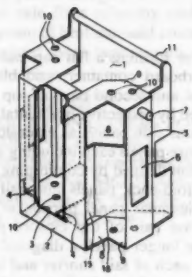
1. Device for stacking plate-like members, such as sheet metal blanks, cut by a guillotine shears, comprising a drum having an axis and being rotatable about the axis, said drum having a circumferentially extending outside surface, a plurality of partitions extending radially outwardly from the outside surface of said drum and each pair of said partitions forming therebetween a compartment closed radially inwardly by the outside surface of the drum and being open radially outwardly, each of said compartments being movable with said drum into a first position for receiving a plate-like member, into a second position spaced angularly from the first position and into a third position spaced angularly from the second position and located opposite the first position with the third position arranged for removing the plate-like member from said compartment, a displacement device located at the second position and being movable in the axial direction of said drum for selectively positioning the plate-like member within the compartment in the axial direction of said drum so that in the third position the plate-like member can be removed to a selected stacking position, and said displacement device being positionable out of the path of said partition when said drum is rotated.

4,520,934

CRADLE FOR SEMICONDUCTOR ELEMENT CARRIER

Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,624
Int. Cl.³ B65D 85/30
U.S. Cl. 211—41 10 Claims



1. A cradle for receiving a carrier which has leg portions and contains semiconductor elements stored therein, and mounting said carrier on a predetermined position of a spin drier, which cradle comprises a rear wall with a window therein, said rear wall having a pair of end edges and a pair of side edges, a pair of opposed end walls extending at right angles from said rear wall end edges, a pair of stepped portions extending at right angles from said rear wall side edges, an inclined wall portion extending outwardly from each said stepped portion, and a pair of opposed parallel side walls extending from said inclined wall portions, the end portions of said stepped portions and inclined wall portions being cut away to receive the corners of said carrier, the leg portions of said carrier being received between said stepped portions and restrained thereby against outward movement.

4,520,935

TREE STAND

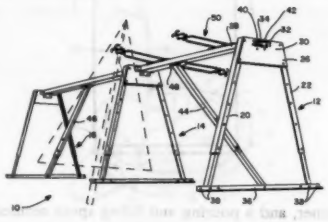
Howard Churchill, 662 Dartmouth Ave., San Carlos, Calif. 94070

Filed Mar. 21, 1984, Ser. No. 591,838
Int. Cl.³ A47F 7/00
U.S. Cl. 211—124 13 Claims

1. A stand for displaying one or more objects comprising:
a first support tower;
a second support tower;
a channel;
first means for allowing the first support tower to support the channel at one location on the channel;
second means for allowing the second support tower to support the channel at another location on the channel;

means for securing an object to the stand, said securing means including a base means for holding said securing means in said channel, a clip means for allowing the object to be secured to said securing means and an extension means for connecting said base means to said clip means, said means being slidably positionable in said channel; wherein

said channel has at least one lip; and



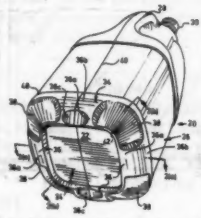
said base means of said securing means include two parallel rods, each of which has been bent into substantially a U shape so as to have first and second legs, and crossbar means interconnecting the first and second legs of the rods and extending therepast, said rods and crossbars insertable into said channel under said lip and said crossbars holding said securing means in said channel.

4,520,936

BLOW MOULDED PLASTIC CONTAINERS

Gerard E. Lyons, Burlington, Canada, assignor to Polybottle, Weston, Canada

Filed May 20, 1982, Ser. No. 380,455
Int. Cl.³ B65D *1/02, 23/00*
U.S. Cl. 215—1 C **5 Claims**



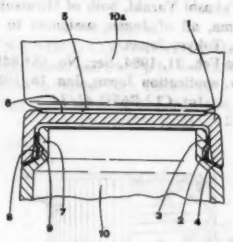
1. A blow moulded plastic container which is of substantially rectangular shape in plan and which has a correspondingly shaped base adapted to support the container on a surface, and a side wall which extends upwardly from the base and defines therewith a space within the container, wherein the base is of substantially uniform wall thickness throughout and includes a central portion which is raised with respect to a plane in which the base makes contact with a said surface and a marginal portion surrounding said raised central portion, said marginal portion including four supporting sections spaced around said portion, said supporting sections being positioned essentially mid-way along each side of the base and being adapted to support the container on a said surface in use, said sections having respective outer surfaces which are disposed in said plane at the lower extremity of the container and which curve convexly upwardly from said plane and merge into the side wall of the container, intervening areas of said marginal portion between said supporting sections being depressed inwardly of the container with respect to said supporting sections and extending around corners of said marginal portion of the base.

4,520,937

GLASS STORAGE JAR

Pier L. Bormioli, Mariano, Italy, assignor to Vetreria Padana Polesana, S.p.A., Bergantino, Italy

Filed Nov. 21, 1983, Ser. No. 553,760
Claims priority, application Italy, Feb. 8, 1983, 28919/83[U]
Int. Cl.³ B65D *21/00*
U.S. Cl. 215—10 **4 Claims**



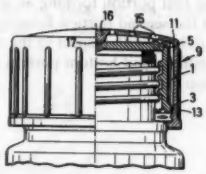
1. A glass storage jar comprising a body, a neck extending from the body and having a smaller circumference than the body portion from which it extends and defining a shoulder, a lid sized to fit over the neck and having an inner circumference larger than the outer circumference of the neck so as to provide a radial clearance between the neck and lid when the lid is placed on the neck, an annular seal having first and second stretches, said first stretch extending along the neck and having at least a portion thereof in contact with the neck, said first stretch having at least a portion thereof greater than the radial clearance between the lid and the neck, said second stretch extending radially and being sized to seat on said shoulder and adapted to have the lid rest thereon.

4,520,938

SAFETY SCREW CAP

Robert G. Finke, Finnentrop, Fed. Rep. of Germany, assignor to Robert Finke GmbH, Finnentrop, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 273,021
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022465
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—220 **15 Claims**



1. Safety screw cap comprising an inner cap arranged to be secured onto the neck of a bottle and having an axially extending annular side wall and an end closure wall extending transversely across and forming a closure for one end of said side wall, said side wall having an inner surface with a thread formed thereon for engagement with a corresponding thread on the neck of the bottle, an outer cap forming a cover over said side wall and end closure wall of said inner cap, said outer cap having an axially extending annular side wall and an end enclosure wall extending transversely across and forming a closure for one end of said side wall, wherein the improvement comprises that said end closure wall of said outer cap has flexibility improving perforations extending therethrough with

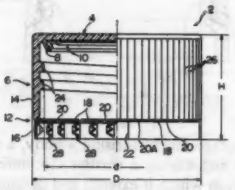
each said perforation having the shape of a laterally closed space.

4,520,939

PILFER-PROOF PLASTIC CLOSURE FOR CONTAINERS

Junichi Itsubo; Takashi Yazaki, both of Hiratsuka, and Fumio Mori, Yokohama, all of Japan, assignors to Japan Crown Cork Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,845
Claims priority, application Japan, Jan. 18, 1984, 59-5756
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 5 Claims



1. A pilfer-proof plastic closure for a container equipped with a mouth-neck portion having an external thread formed on its peripheral surface and a holding jaw portion located below the external thread, said closure comprising a top panel wall and a cylindrical skirt wall extending downwardly from the peripheral edge of the top panel wall, said skirt wall having formed therein a circumferentially extending breakable line dividing the skirt wall into a main portion above the breakable line and a pilfer-proof bottom portion below it, said main portion having formed on its inner surface an internal thread to be engaged with the external thread on the mouth-neck portion of the container and said pilfer-proof bottom portion having formed on its inner surface a plurality of radially inwardly projecting engaging flaps at circumferentially spaced positions; each of said engaging flaps having a first portion extending from the inner surface of the pilfer-proof bottom portion tiltedly in a direction opposite to the direction of rotation of the closure at the time of mounting it on the mouth-neck portion of the container and a second portion bent with respect to the first portion and further extending from the end of the first portion, and the first portion forming an angle α smaller than 90 degrees and the second portion forming an angle β larger than the angle α, both with respect to the tangent of the inner surface of the pilfer-proof bottom portion at the base edge of the engaging flap.

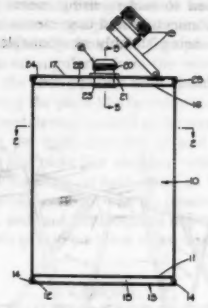
4,520,940

CONTAINERS FOR LIQUIDS

Malcolm W. Boyd, Walsall, and Michael G. Mander, Wombourne, both of England, assignors to W. A. Goold Limited and W. J. Goodwin & Son Limited, both of Walsall, England

Filed Jun. 29, 1984, Ser. No. 626,288
Claims priority, application United Kingdom, Jul. 2, 1983, 8318007
Int. Cl.³ B65D *6/34, 8/04, 8/06*
U.S. Cl. 220—68 22 Claims

1. A container comprising a tubular body portion having a seamless, continuous internal surface, respective inner end members fitted in the body portion to close the ends thereof, respective outer end members being secured by soldering or the like to the body portion at the ends thereof to define respective chambers between them and the inner end members, the solder or the like being out of contact with the interior of



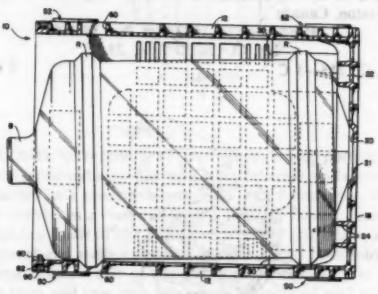
the container, and a pouring and filling spout secured at one end of the container.

4,520,941

WATER BOTTLE CRATE

John A. Hagan, Huntington Beach, and James Lafferty, Fullerton, both of Calif., assignors to Rehrig Pacific Company, Los Angeles, Calif.

Filed Sep. 14, 1984, Ser. No. 650,611
Int. Cl.³ B65D *11/16*
U.S. Cl. 220—72 7 Claims



1. A molded plastic crate for transporting and storing differently configured five-gallon water bottles comprising:

two pairs of opposed side walls integrally joined at their adjoining longitudinal edges to define a square box;

a centrally apertured bottom closing one end of said box;

reinforcing internal corner strut means nested within each of the four corners of said box integrally joined with adjacent side walls and said bottom, said strut means terminating immediately above said bottom to leave the box interior fully open throughout a major portion of its length;

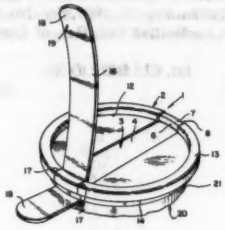
each of said side walls having an exterior midsection portion that is recessed where said adjoining edges form the upstanding corners of said box to accommodate hand-truck pickup when the crate is lying on it side; and

one pair of said side walls having oppositely aligned wide handle openings provided at a first height above said box bottom and the other pair of said side walls having oppositely aligned wide handle openings provided at a second height above said box bottom that is different from said first height, said handle openings serving to catch the circumferential rib on a bottle exterior to restrain the bottle against slippage from the crate.

4,520,942
CONTAINER CLOSURE HAVING A FRANGIBLE OUTER CAP

Davis B. Dwinell, Warren, N.J., assignor to American Flange & Manufacturing Co. Inc., Linden, N.J.

Filed Apr. 20, 1984, Ser. No. 602,481
Int. Cl.³ B65D *51/20*
U.S. Cl. 220—257 8 Claims

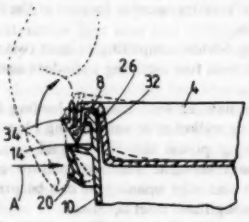


1. A two piece tamper-evident closure assembly comprising a metal tear-off overcap and a plastic reusable undercap, said undercap including a recessed center panel surrounded by a downwardly opening sealing channel said sealing channel having an inner wall extending upwardly substantially vertically from said center panel, an annular top wall and a depending substantially vertical outer wall terminating in a lower free edge, said inner wall and said outer wall being substantially equal in vertical length, said overcap having a complimentary configuration so as to closely confine said undercap, a diametrically extending tear strip formed in said overcap commencing in an outwardly projecting gripping ear, said tear strip defined by a pair of score lines commencing at either side of said ear and extending across said cap wherein removal of said overcap is achieved by pulling said ear first radially outwardly so as to tear across the contiguous outer wall portion then pulling upwardly and radially inwardly causing said tearing to continue across said center panel and terminate at the remote sealing channel inner wall.

4,520,943
RECLOSABLE PLASTIC CONTAINER

Jens O. Nielsen, Hvidhoj 2, DK-8870 Langaa, Denmark

Filed Jul. 26, 1984, Ser. No. 634,537
Claims priority, application Denmark, Jul. 28, 1983, 3449/83
Int. Cl.³ B65D *43/04*
U.S. Cl. 220—281 6 Claims

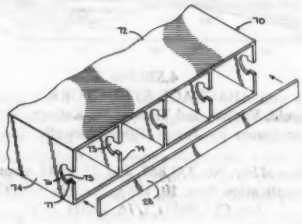


1. A sales packing of the bucket or jug type, comprising a plastic container, the mouth edge portion of which is provided with an upper annular groove between an inner mouth flange and an outer mouth flange, and a lid having a depending edge flange, which is received in said edge groove so as to engage underneath an annular locking nose portion of the interior side of the outer mouth flange of the container and be inwardly supported by the exterior side of the inner mouth flange, characterized in that additional cooperating locking nose means are provided on the outside of the inner mouth flange of the container and on the inside of the depending edge flange of the lid, respectively, and that the outer mouth flange of the container is designed so as to be outwardly and downwardly foldable into a swung down position, in which a local, radially inwardly directed pressure thereon will result in the inner mouth flange of the container being resiliently inwardly displaced so as to thereby get released from its locking nose engagement with the edge flange of the lid.

4,520,944
OPEN-ENDED CONTAINER CLOSURE

Robert W. Bachi, Itasca, and Phillip L. Bachi, Schaumburg, both of Ill., assignors to Bachi, Inc., Itasca, Ill.

Filed Apr. 26, 1984, Ser. No. 604,167
Int. Cl.³ B65D *11/00*
U.S. Cl. 220—305 23 Claims

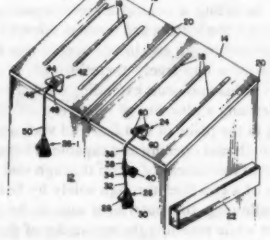


1. A closure for an open-ended container comprising:
at least one wall member;
a slot in said wall member opening into said wall member from the outside thereof in a first direction and extending through said wall member;
a locking member for temporary retentive engagement in said slot and extending over a portion of the open-ended container to provide a barrier to the contents thereof;
said locking member and said slot constructed and arranged to retain said locking member in said slot and prevent removal therefrom in said first direction yet permit removal therefrom by a force acting in a direction substantially transverse to said first direction.

4,520,945
SOLID WASTE RECEPTACLE SECURITY SYSTEM

Allan M. Hodge, 5852 Lomond Dr., San Diego, Calif. 92120

Filed Mar. 19, 1984, Ser. No. 590,697
Int. Cl.³ B65D *45/00*
U.S. Cl. 220—315 18 Claims



1. A locking trash bin assembly comprising:
a trash bin;
at least one lid for said trash bin, said lid being formed of relatively flexible material;
locking means secured to the front of each said lid and to the

front of said trash bin for preventing the opening of said lid; and

non-ferrous reinforcing rod means secured to the inside of said lid toward the front thereof and extending toward the corners thereof, to prevent deformation or flexing of said lid and opening thereof while said lid is locked.

4,520,946

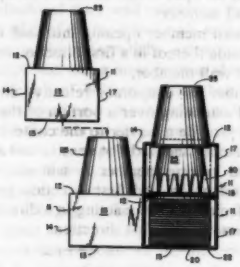
PACKAGE STRUCTURE

Jerome Gould, Encino, and Thomas W. Kellogg, Irvine, both of Calif., assignors to James River-Norwalk, Inc., Norwalk, Conn.

Continuation of Ser. No. 338,867, Jan. 12, 1982, abandoned. This application Nov. 10, 1983, Ser. No. 550,925

Int. Cl.³ B65D *5/16*; B65H *1/00*

U.S. Cl. 221—63 3 Claims



1. A dispenser carton for packaging and separately dispensing a cup from a stack of rimmed tapered disposable cups each of which has a tapered sidewall, a bottom wall, and an open top surrounded by a rolled rim, comprising a container having substantially square planar parallel mutually spaced first and second end walls and connecting rectangular sidewalls; said first end wall including a central circular opening of a size sufficient to permit the bottom and tapered sidewall of a cup to extend freely therethrough and insufficient in size for the passage of the rim of a cup freely therethrough; a plurality of relatively short radial knife cuts extending outwardly from said opening and defining a plurality of relatively stiff flexible tabs normally lying in the plane of said first end wall while a cup is projecting through said opening and capable of being deflected in the direction of movement of a cup through said opening to permit passage of a cup therethrough solely by flexure of said tabs, thereby allowing the outermost cup to be withdrawn from the carton while retaining the remainder of the stack, said second end wall including an opening axially aligned with and smaller in diameter than the opening in said first end wall, said second end wall having a plurality of radial slits extending from said opening therein outwardly a distance from the center of said opening sufficient to exceed the radius of the small end of a cup but less than a distance equal to the radius of the large end of a cup.

4,520,947

MACHINERY FOR FILLING CAVITIES WITH FLOWABLE REACTION MIXTURES

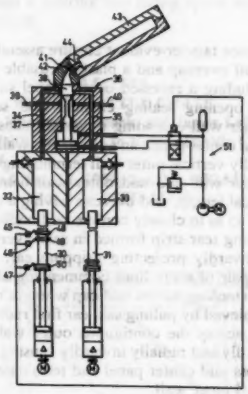
Ferdinand Althausen, Neunkirchen Seelscheid; Ferdinand Proksa, Leverkusen, and Ulrich Osinski, Koenigswinter, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 305,238, Sep. 24, 1981, abandoned, which is a division of Ser. No. 2,776, Jan. 11, 1979, Pat. No. 4,309,373. This application Aug. 23, 1982, Ser. No. 410,220

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1978, 2803311

Int. Cl.³ B29F *1/03*

U.S. Cl. 222—63 1 Claim



1. An apparatus for filling a cavity with a flowable reaction mixture through an inlet opening located at the bottom of the cavity comprising:

(a) a metering device comprising at least two metering pistons and at least two metering cylinders associated therewith,

(b) a mixing chamber with conduits leading from each of said metering cylinders to said mixing chamber,

(c) a displacing piston slidable in said mixing chamber whereby said flowable reaction mixture can be either supplied to said inlet opening or can be prevented from flowing through said inlet opening,

(d) a regulator means for controlling said displacing piston, said regulator means being associated with two end contacts, located on at least one of said metering pistons, through two stop switches for interrupting and continuing the flow of flowable reaction mixture through said inlet opening, the first of said stop switches and the first of said end contacts being adjusted in such a way that when they contact each other, the stroke length of the metering piston associated therewith corresponds to a volume equal to the volume of the reaction mixture to be fed into the cavity.

4,520,948

DISPOSABLE CONTAINER FOR LIQUIDS AND APPARATUS FOR DISPENSING LIQUID FROM SUCH CONTAINER

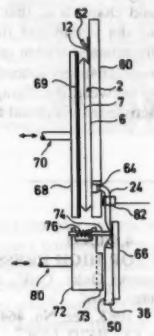
Hans-Joachim Hampel, Niederhöchstadt; Ludwig Scondo, Frankfurt am Main; Jürgen Stahl, Frankfurt am Main; Wilhelm Wegner, Frankfurt am Main, all of Fed. Rep. of Germany, and Harry Bonne, Mellen, Switzerland, assignors to Jacobs Beverage Systems AG, Zug, Switzerland

Filed Dec. 8, 1981, Ser. No. 328,799

Claims priority, application Switzerland, Dec. 8, 1980, 9035/80

Int. Cl.³ G01F 11/02

U.S. Cl. 222—103 5 Claims



1. A one-way package for storing fluid and from which the stored fluid may be dispensed in successive metered portions, said one-way package comprising:

means defining a fluid-tight bag enclosing a fluid storage space;

an extraction tube having an inlet end sealingly communicated through said bag to said fluid storage space and an outlet end disposed externally of said fluid storage space;

a flat package box surrounding said bag, said flat package box being made of relatively stiff material compared with said bag and being constructed and arranged for also containing said tube, for storage;

said tube including an extraction duct extending therealong, a longitudinally extending portion of which provides a metering chamber normally in communication with said inlet end of said tube;

said tube further including a pressure relief valve provided for said extraction duct near said outlet end of said tube for normally closing said outlet end of said tube;

means provided between said inlet end of said tube and said metering chamber constructed and arranged for permitting interruption in communication between said metering chamber and said inlet end of said tube;

means for squeezing the bag; said flat package box including two relatively broad opposed wall means which are perimetrically joined to one another by relatively narrow wall means, these relatively narrow wall means including a total of one, outwardly-bowed fold line means extending perimetrically of the flat package box on the relatively narrow wall means approximately midway between the two relatively broad opposed wall means, whereby said bag may be emptied in dispensing fluid from said fluid storage space into said duct by actuating said means for squeezing the bag by pressing one of said two relatively broad opposed wall means towards the other of said two relatively broad opposed wall means while permitting said relatively narrow wall means to fold on itself along said fold line means.

4,520,949

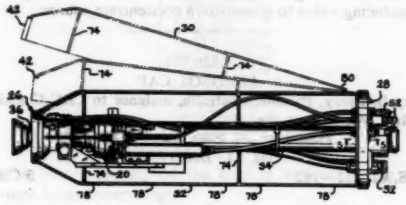
PROTECTIVE HOUSING FOR COATING APPLICATOR

David M. Seitz, Blissfield, Mich., and Richard Weinstein, Toledo, Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Apr. 11, 1983, Ser. No. 483,865

Int. Cl.³ B67D 1/16

U.S. Cl. 222—108 12 Claims



1. A housing for a coating applicator including a coating dispenser and means for supplying coating material to the coating dispenser, said housing comprising in combination, a front bulkhead adjacent the coating dispenser, a pair of mating housing members defining a chamber for a portion of the coating applicator, said housing members defining longitudinally extending mating edges, means on each of said housing members for engagement with said front bulkhead, a rear bulkhead spaced from said front bulkhead, said front bulkhead and said rear bulkhead supporting said mating housing members in surrounding relationship to said portion of said coating applicator, said rear bulkhead including a cup-shaped base for receiving said housing members, and spring means for urging at least one of said housing members against one of said bulkheads.

4,520,950

IN-HOME DRINK DISPENSER

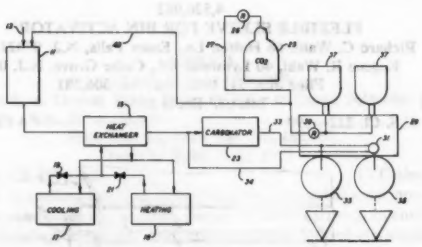
Edward L. Jeans, Gwent, Wales, assignor to Cadbury Schweppes Public Limited Company, London, England

Continuation-in-part of Ser. No. 140,685, Apr. 16, 1980, abandoned. This application Jun. 29, 1982, Ser. No. 393,299

Claims priority, application United Kingdom, Jul. 11, 1979, 7924162

Int. Cl.³ B67D 1/04

U.S. Cl. 222—129.1 73 Claims



1. A manifold for use with a beverage dispenser comprising:

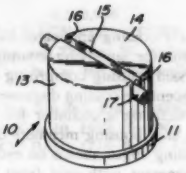
(a) a manifold body comprising:

(1) a first passage, formed in said body, having an inlet, for connection to a source of pressurizing gas and an outlet adapted to be coupled to a diluent supply, to provide pressurization thereof;

(2) a second passage, formed in said body, having an inlet adapted to be coupled to the diluent supply and an outlet adapted to be coupled to a dispensing valve;

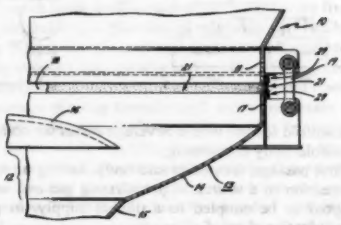
(b) fittings extending from the outlet of said first passage and inlet of said second passage in parallel spaced relationship adapted to mate with mating fittings of diluent supply;
(c) first and second check valves in said fittings, whereby pressurization within said manifold will be maintained when the diluent supply is disconnected from said manifold;
(d) a first pressure reducing valve disposed in said body;
(e) a third passage in communication with said first passage for supplying said source to the inlet of said pressure reducing valve; and
(f) a fourth passage for coupling the outlet of said first pressure reducing valve to pressurize a concentrate source.

4,520,951
AEROSOL CAP
Roy B. Facey, Pymble, Australia, assignor to CRC Chemicals Inc., Warminster, Pa.
Filed May 30, 1980, Ser. No. 154,750
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—182 **5 Claims**



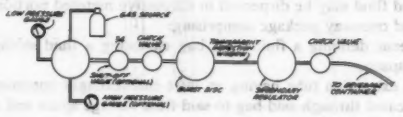
4. A cap for an aerosol container comprising an annular wall open at it bottom end and closed at it upper end by a top wall perpendicular to the annular wall, the top wall having a diametric transverse groove formed integral with the top wall and adapted to releasably retain a tube in a lowermost portion thereof, said groove being open at each end, the groove having a substantially semi-circular cross-section at the lowermost half thereof and having substantially parallel straight sides at the uppermost half thereof integral with the top wall so as to be open at the top, the groove further having protuberances along the inner faces of the parallel sides adjacent the upper most portion of the sides at spaced locations along the inner faces thereof for frictionally embracing and releasably retaining the tube in the groove, and a plurality radially directed lugs at spaced portions along the inner periphery of the annular wall at the lowermost portion thereof for engaging and releasably securing the cap to the top end of the container.

4,520,952
FLEXIBLE SLEEVE FOR BIN ACTIVATOR
Richard C. Wahl, 66 Holton La., Essex Falls, N.J. 07021, and Eugene R. Wahl, 40 Lynwood Rd., Cedar Grove, N.J. 07009
Filed Jun. 21, 1983, Ser. No. 506,381
Int. Cl.³ B65G *65/44*
U.S. Cl. 222—199 **4 Claims**



1. A sealing sleeve assembly for sealing the gap between a cylindrical flange on the bottom of a storage bin and similar diameter cylindrical flange on the upper end of a bin activator, said assembly including:
(a) a flexible sleeve of generally cylindrical shape having a diameter and axial length such to closely overlie the bin and bin activator flanges and span the gap therebetween;
(b) upper and lower pairs of laterally extending circumferential ribs defining therebetween upper and lower channels respectively, each of said channels having straight parallel sides extending at right angles to the sleeve;
(c) upper and lower clamp bands received within said upper and lower channels respectively, to securely clamp said sleeve to the cylindrical flanges of said storage bin and bin activator, said clamp bands having a width substantially equal to the width of said channels and a thickness less than the depth of said channels so that while the sealing sleeve is secured to the cylindrical flanges said clamp bands are frictionally retained within said channels; and
(d) said upper and lower channels spaced apart a distance greater than the gap between the storage bin cylindrical flange and the bin activator cylindrical flange spanned by said sealing sleeve.

4,520,953
SAFETY APPARATUS FOR HIGH PRESSURE SYSTEMS
Merton R. Fallon, Thousand Oaks, Calif., assignor to Draft Systems, Inc., Northridge, Calif.
Filed Feb. 7, 1983, Ser. No. 464,593
Int. Cl.³ B67D *1/04*
U.S. Cl. 222—396 **6 Claims**



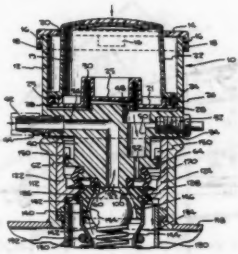
1. A safety apparatus for use in beer dispensing applications wherein a source of high pressure gas is interconnected with a container containing the beer to be dispensed, said apparatus comprising:
(a) a primary pressure reducing regulator interconnected between the container and the source of high pressure gas and proximate the latter, said primary regulator being capable of adjustment to permit the continuous flow of gas toward the container at a pressure of about 35 psi;
(b) a frangible burst disc interconnected between the container and said primary regulator, said burst disc being adapted to fail and to automatically vent source gas flowing therethrough to atmosphere at a pressure of about 80 psi;
(c) a secondary pressure reducing regulator interconnected between the container and said burst disc and proximate the latter, said secondary regulator being capable of adjustment to permit the continuous flow of gas toward the container at a pressure of about 15 psi;
(d) a check valve interconnected between the container and said secondary regulator, said second check valve being adapted to permit the flow of gas toward the container, but to restrict all fluid flow in the opposite direction; and
(e) a check valve interconnected between the container and said primary regulator to permit the flow of gas toward the container, but to restrict gas flow in the opposite direction, said check valve being adapted to restrict gas flow toward said secondary regulator until the input pressure to said check valve reaches about 35 psi.

4,520,954

COUPLER

Anthony D. Brown, Woodland Hills, Calif., assignor to Grundy Dispense Systems, Inc., Canoga Park, Calif.

Filed May 3, 1982, Ser. No. 373,963
Int. Cl.³ B67D 1/04
U.S. Cl. 222—400.8 4 Claims



1. An improved coupler which is used to dispense fluid under pressure from a container by means of a probe at one end of the coupler which is inserted into a valve assembly at the opening of the container, wherein said valve assembly comprises dual valves which includes a first valve assembly and a second ball valve assembly, the first valve assembly comprising a first valve housing which has a first valve seat at its lower interior surface and a first valve member, the second ball valve assembly comprising a ball valve member which abuts the lower interior portion of the first valve member which acts as its valve seat, and a valve passageway associated with each of the valve assemblies which are opened when the valve members are moved away from the valve seats, wherein a probe head at the forward tip of the probe pushes the ball valve member away from its seat to open one passageway and a section of the probe head pushes first valve member away from the first valve seat to open the other passageway, so as to permit gas or air to be placed into the container and to permit fluid to exit the container through the opened passageways in the coupler, wherein the improvement comprises:

a. the probe head at the forward tip of the probe which being fixed and integral with the probe;

b. a large flexible bellows type fluid seal member placed on the outermost circumference of the foreward end of the probe;

c. said large flexible bellows type fluid seal member being of one piece construction and containing three sections, an outwardly extending upper portion, an inwardly extending middle portion and an outwardly extending lower portion; and

d. said large flexible bellows type fluid seal member being of sufficient height so that the outwardly extending lower portion comes in contact with an upper surface of said first valve housing to thereby seal both of said valve passageways before the probe head comes in contact with said ball valve member and moves it away from its valve seat;

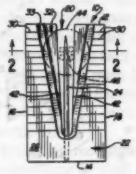
e. whereby said large bellows type fluid seal member will prevent any fluid from spewing out of the container after the probe head causes the entire valve assembly to open, and the flexibility of the three section design in the large bellows type fluid seal member creates a bellows action which permits the seal to fold in on itself between the upper portion and middle portion and permits the lower portion to be substantially flat against the upper surface of said first valve housing to thereby form a very secure sealing means.

4,520,955

BUTTON SEWING AID

Edgar C. Gutweniger, 5618 N. McVicker Ave., Chicago, Ill. 60646

Filed Jan. 9, 1984, Ser. No. 569,296
Int. Cl.³ A41H 37/10
U.S. Cl. 223—044 16 Claims



1. A button sewing aid for holding buttons having sew through holes comprising:

a button holding jig having front and rear edges and a base portion adjacent the rear edge,

a groove in the jig for receiving a button, the groove being open at the front edge and having a bottom and sidewalls, the sidewalls converging towards each other from the front edge towards the rear edge, the button received between the converging sidewalls and upon the bottom of the groove,

an open channel extending from the front edge towards the rear edge and terminating at the base portion, the width of the open channel being at least as wide as the space between the sew through holes of the button,

an elongated pin extending from the base portion towards the front edge and disposed within the open channel and parallel to the long axis of the channel with the button positioned so that the sew through holes in the button lie on either side of the pin with the pin disposed between the material and the button to provide a shank of thread therebetween after the button is sewn and the jig removed,

whereby the button is held by the jig in its proper position adjacent the material during stitching with the jig being removed after the button is sewn to the material.

4,520,956

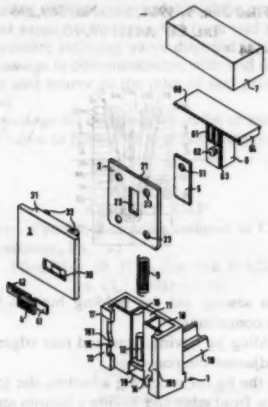
STAPLING MACHINE

Jose E. A. Urresti, Eibar, Spain, assignor to Olave, Solozabal y Cia., S.A., Eibar, Spain

Filed Apr. 15, 1983, Ser. No. 485,257
Int. Cl.³ B25C 5/02, 5/11
U.S. Cl. 227—120 14 Claims

1. A stapling machine, comprising two elongated arms movable relative to one another, one of the arms carrying an anvil for bending over staple ends, said arms being formed of a single piece having a weakened joint area for rotation; guiding means to prevent sideways bending between said arms and including first means provided on one arm and interacting with second means provided on the other arm; a travelling assembly movable to at least one position for its disassembling to allow access to a stapling area; a stapling head mounted on the other arm, and having a supporting frame with a rear extension and a front formed as a guide for the associated travelling assembly; at least two leaves which, beginning at the arms form a single body with the arms and allow flexible motion in the joint area;

and a staple magazine formed by the other arm carrying the stapling head and the rear extension of the supporting frame,



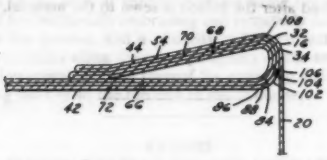
the staple magazine being capable of undergoing longitudinal motion with respect to the other arm.

4,520,957

IN-FOLDED FIN SEAL END CLOSURE

Robert E. Lisiecki, Orchard Lake, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jul. 26, 1984, Ser. No. 634,718
Int. Cl.³ B65D 5/74
U.S. Cl. 229—17 R **6 Claims**



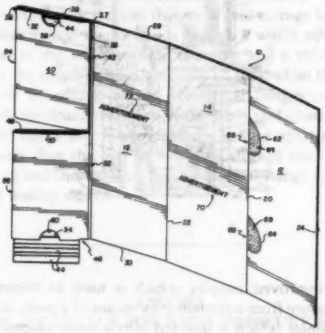
1. In a blank for constructing a container adaptable to being folded into a flat end container, wherein the blank includes five body portion panels interconnected by vertical score lines, five end closure panels connected via a first row of horizontal score lines to respective ends of the body portion panels; said five end closure panels including two panels having triangular panels respectively connected to the ends of two alternate body portion panels, and inner closure panels respectively connected to the ends of the other three alternate body portion panels; a pair of additional triangular panels connected via diagonal score lines to the opposite sides of each of said triangular panels; sealing panels respectively connected via a second row of horizontal score lines to said inner closure panels; and a pair of sealing panels respectively connected via said second row of horizontal score lines to each pair of additional triangular panels; the improvement comprising two sets of supplementary score lines formed on the edge portions of the inner closure panels located adjacent opposite sides of each pair of aligned additional triangular panels and sealing panels.

4,520,958

MULTI-COMPARTMENT ENVELOPE FOR COUPON NESTING

John H. Jones, Westfield, and Donald W. Schoenleber, Princeton, both of N.J., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Jun. 23, 1983, Ser. No. 507,139
Int. Cl.³ B65D 27/08
U.S. Cl. 229—72 **20 Claims**



1. A multi-compartment envelope for coupon nesting, comprising:

(a) a generally rectangular blank having first, second and third spaced parallel scorelines defining first, second, third and fourth generally rectangular interconnected panels;

(b) said first panel and said fourth panel each having a side edge;

(c) a fold in said fourth panel generally equidistant said fourth panel side edge and said third scoreline and generally parallel thereto providing a first panel portion and a second panel portion;

(d) means securing said fourth panel side edge to said first panel portion generally adjacent said third scoreline whereby said second panel portion overlies said first panel portion and thereby said panel portions provide a compartment;

(e) a slit being disposed in said first and second panel portions and extending from said fold to generally adjacent said third scoreline and thereby dividing said compartment into a first compartment and a second compartment;

(f) a first and second contoured slit, each of said contoured slits being disposed at least in part in said first panel and each of said contoured slits defining a wafer tab;

(g) said first panel being folded on said first scoreline and thereby overlying said second panel whereby said wafer tabs extend a substantial distance in a first direction away from said first panel;

(h) said fourth panel being folded along said third scoreline and thereby overlying said third panel;

(i) said third panel being folded along said second scoreline whereby said fourth panel overlies said first panel and said third scoreline is proximate said first scoreline;

(j) said wafer tabs being folded on a line generally parallel to said first scoreline whereby said wafer tabs extend in a second direction generally aligned with said first panel and a first surface of each of said wafer tabs engages a substantial portion of said third panel; and,

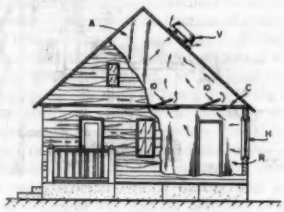
(k) seal means securing said first surface of each of said wafer tabs to said third panel.

4,520,959

ENERGY SAVER DAMPER ASSEMBLY

Stanley Kolt, Mamaroneck, N.Y., assignor to Leonard W. Suroff, Jericho, N.Y., a part interest

Filed Jun. 20, 1983, Ser. No. 505,789
Int. Cl.³ F24F 13/10
U.S. Cl. 236—49 17 Claims



1. An energy saver automatic temperature responsive vent for permitting the passage of air from one defined space to another comprising:

(a) frame means for mounting adjacent to an opening from said one defined space to said another defined space, said frame means having a central passage disposed therethrough;

(b) flap means movably mounted to said frame means; said flap means being movable from a closed position substantially blocking said passage to an open position permitting the free flow of air therethrough, said flap means assuming said closed position when at rest; said flap means being pivotally affixed to said frame means;

(c) temperature responsive drive means mounted to detect temperature changes adjacent to said opening, said temperature responsive drive means being coupled to said flap means and being actuated in response to temperature changes within a predetermined range, actuation of said temperature responsive drive means moving said flap means from said rest position; and

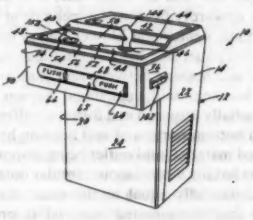
(d) adjustment means coupled to said flap means, said adjustment means for adjustably precluding said flap means from assuming said closed position when at rest, said adjustment means comprising movable wedge means disposed between a portion of said flap means and a portion of said frame means.

4,520,960

BARRIER-FREE WATER COOLER

Robert L. Cushman, Solon, Iowa; Arlan Koester, Rock City, Ill., and Michael Eveland, Cedar Rapids, Iowa, assignors to Halsey Taylor Division of King-Seeley Thermos Co., Prospect Heights, Ill.

Filed Jan. 13, 1983, Ser. No. 457,729
Int. Cl.³ E03B 9/20
U.S. Cl. 239—29 8 Claims



1. A barrier-free water cooler in combination in a water dispensing apparatus adapted for operative association with a water source comprising:

a cabinet structure having a first side portion extending laterally between second and third spaced generally parallel side portions;

water dispensing means associated with said apparatus and including valve means for controlling the flow of water from the source thereof to said dispensing means;

mounting bracket disposed within said cabinet structure and having laterally opposed mounting portions;

first actuating means for actuating said valve means comprising first manually engageable push bar presented on said first side portion and means for slidably and pivotally securing said first push bar to each of said laterally opposed mounting portions;

at least one second actuating means for actuating said first actuating means comprising second manually engageable push bar presented on one of said second and third side portions, said second push bar having laterally opposed ends, one of said ends being pivotally secured to said cabinet structure and the other of said ends having an actuating leg extending generally orthogonal to said second push bar;

said first actuating means defining a camming surface and said actuating leg portion being positioned adjacent said camming surface;

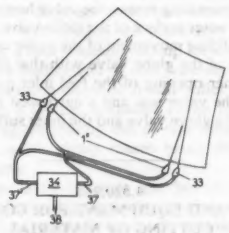
whereby selective application of a force to either end of said first push bar means results in actuation of said valve means and whereby selective application of a force to said second push bar means causes said actuating leg portion to slidably engage and move said camming surface to effect actuation of said first push bar means, thereby resulting in actuation of said valve means.

4,520,961

WINDSHIELD WASHING SPRAY WITH JET INCLINATION VARIABLE AS A FUNCTION OF THE SPEED OF THE VEHICLE

Francois Hueber, Saint-Louis, France, assignor to Fabrique de Produits Chimiques, d'Entretien et de Degraissage Ravicolor, S.A., Saint-Louis, France

Filed Jul. 20, 1983, Ser. No. 515,480
Claims priority, application France, Jul. 21, 1982, 82 13038; Feb. 15, 1983, 83 02620
Int. Cl.³ B05B 1/10
U.S. Cl. 239—284 R 10 Claims



1. A windshield washing spray with jet inclination variable as a function of the speed of the vehicle, comprising a first fixed spray (1″) adapted to direct a jet of washing liquid at a relatively low portion of a windshield, a second fixed spray (33) adapted to direct washing liquid at a relatively high portion of a windshield, an electromagnetic ball valve (34) having an inlet orifice (38) supplying said washing liquid to said valve, a first outlet passage for supplying said liquid to said first spray (1″) and a second outlet passage (37′) for supplying said liquid to said second spray (33), and means responsive to the speed of the vehicle to actuate said valve (34) so that said liquid passes from said inlet orifice (38) to said first outlet passage (37) at

relatively low speed of the vehicle and from said inlet orifice (38) to said second outlet passage (37') at relatively high speed of the vehicle.

4,520,962

MAGNETIC FUEL INJECTION VALVE

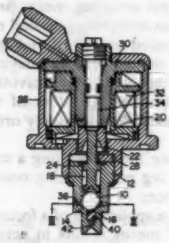
Masakichi Momono; Hisanori Moriya; Masahiro Souma, and Eiji Hamashima, all of Katsuta, Japan, assignors to Hitachi, Ltd. and Hitachi Automotive Engineering Co., Ltd., both of Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,802

Claims priority, application Japan, Jan. 30, 1981, 56-13486

Int. Cl.³ F02M *51/08*

U.S. Cl. 239—585 7 Claims



1. A magnetic fuel injection valve comprising a coil; a core provided at a center of the coil; a yoke formed around the coil and connected with the core; a plunger facing one end of the core and slidable along a central axis of the yoke; a globe valve formed at the other end of plunger on an opposite side of the core; a valve housing connected to the yoke, the globe valve being adapted to slide inside the valve housing; a valve seat facing the globe valve, the valve housing being adapted to guide the outer surface of the globe valve in sliding movement thereof to align the center of the globe valve with that of the valve seat; a radially extending fuel inlet passage communicating an outer surface of the valve housing with an immediate upstream side of the valve seat inside the valve housing, the fuel inlet passage being formed so that the fuel is not swirled at the upstream side of the valve seat;

means provided at the downstream side of the valve seat for generating a spiraling movement in outgoing fuel in a direction perpendicular to a direction of injection; and a fuel metering orifice provided downstream of the spiraling flow generating means; the valve housing is adapted to engage an outer surface of the globe valve during an entire stroke of sliding movement of the globe valve for aligning the center of the globe valve with that of the valve seat, and an inner opening of the fuel inlet passage is formed between the valve seat and a narrowest portion of a gap between the glove valve and the inner surface of the valve housing.

4,520,963

PROCESS AND EQUIPMENT FOR CONTINUOUS CUTTING OF MATERIAL

Reiner Grebe, Biedenkopf; Max Norbisrath, and Karl-Heinz Schmidt, both of Breidenbach, all of Fed. Rep. of Germany, assignors to Kramer & Grebe GmbH & Co. KG, Biedenkopf-Wallau, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 378,520

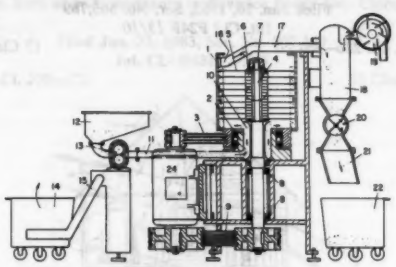
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1981, 3122266

Int. Cl.³ B02C *23/36, 18/00*

U.S. Cl. 241—30 25 Claims

1. Process for cutting material with fast rotating blades on a shaft parallel to the axis of a vessel including the steps of,

continuously feeding material into said vessel while rotating said vessel around said axis with sufficient speed so that the fed material is guided to and positioned against the inside of the vessel wall by the centrifugal force and cut by said fast rotating blades while positioned against the inside of the vessel wall,



and continuously withdrawing the cut material from said vessel thus rotating.

4,520,964

WASTE COMMINUTING APPARATUS

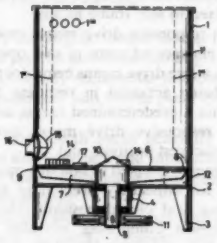
Kurt Rössler, Blankenburgerstrasse 21a, D-4550 Bramsche 1, Fed. Rep. of Germany

Filed Jun. 16, 1982, Ser. No. 389,146

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125309

Int. Cl.³ B02C *19/12*

U.S. Cl. 241—55 8 Claims



1. Comminuting apparatus for the comminution of waste wood material and the like by imparting a loop shaped circulating movement to the waste so that the waste comminutes itself by mutual rubbing, beating and striking, comprising a housing having an inner wall of a generally circular cross-sectional configuration, said housing having a top with an access opening for receiving the waste to be comminuted, said housing defining a feed hopper for the waste to be comminuted, said housing having a bottom portion disposed above a bottom wall, a combined screening and centrifugal plate rotatably mounted in the bottom portion of said housing, said plate having an upper side and an under side, a raised entrainment dog extending upwardly from said upper side at the peripheral edge of said plate, centrifugal blower blades mounted on the underside of said plate, said blades being disposed in said bottom portion of said housing between said plate and said bottom wall of said housing, said centrifugal blower blades being substantially radially disposed and forming stiffening means for said plate, said bottom portion of said housing having an outlet for comminuted material, said outlet being disposed below said plate, said plate having a continuous circular outer edge having a diameter substantially equal to the inner diameter of said housing such that comminuted material is precluded from passing between said outer edge of said plate and the inner wall of said housing, drive shaft means attached to said plate for

rotating said plate, said drive shaft means extending externally of said housing, said plate having an outer radial portion disposed inwardly of said outer edge, a plurality of screening holes in said plate at said outer radial portion for screening and passing the comminuted material from said housing to said outlet, an upwardly projecting guide cone extending upwardly from the central region of said plate, said guide cone having a continuous conical surface having its apex upwardly disposed, said plate and said housing being constructed and arranged to impart a loop-shaped circulating movement to the waste in said housing as a result of the centrifugal action of said plate on the waste coming into contact with said plate such that the waste moves radially outwardly at the bottom portion of said housing above said plate, generally upwardly at the radial outer portion of said housing, generally radially inwardly at the upper portion of said housing and generally downwardly at the radial inner portion of said housing as a hollow funnel forms in the circulated mass of waste material and the waste once again repeats the loop-shaped circulatory movement as the comminuted pieces and particles formed during said loop-shaped circulatory movement of less than the diameter of said screening holes passes out of said housing through said screening holes in said plate, said waste to be comminuted thereby comminuting itself by mutual rubbing, beating and striking as said waste travels said loop-shaped circulatory movement.

4,520,965

APPARATUS FOR WINDING COILS IN ELECTRIC MACHINERY

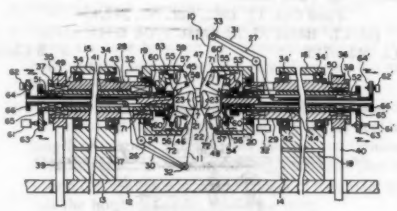
Kazuo Kimura; Yukinori Taneda; Shinichi Tsuyuki, all of Yokohama; Shun Suzuki; Yoshio Hashimoto, both of Katsuta, and Shinichi Sakamoto, Hitachi, all of Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Aug. 4, 1983, Ser. No. 520,196

Claims priority, application Japan, Aug. 7, 1982, 57-137559; Aug. 18, 1982, 57-143819

Int. Cl.³ H02K *15/09*

U.S. Cl. 242—7.05 B **1 Claim**



1. An apparatus for winding coils on an electric machinery component having axial slots, comprising:

means for continuously supplying a wire as coil turns into a selected pair of the slots; and

means for guiding the supplied coil turns as a layer in the paired slots, said guiding means being movable in incremental steps in a direction toward open ends of the slots for laying successive layers of coil turns in the slots,

wherein said guiding means comprises a plurality of fixed formers adapted to be positioned peripherally around the armature for guiding the wires into the slots, and a plurality of movable formers adapted to be positioned at axial ends of the armature for guiding the coil turns to be inserted as the layer in the slots,

wherein said supplying means comprises a table, a pair of rotatable shafts supported on said table, and a pair of flyers mounted on said shafts, respectively, for corotation, and having guide rollers for guiding wires, respectively, said guide means comprising a plurality of splined shafts rotatably and axially movably supported in said rotatable shafts, slide blocks mounted respectively on ends of said splined shafts, respectively, a pair of housings rotatably mounted on ends of said rotatable shafts, a pair of chucks mounted in said housings, respectively, for supporting the armature therebetween, said chucks defining said fixed formers, said movable formers being movably supported on said chucks, and a plurality of former drive arms pivotably mounted on said chucks and pivotably engaging said slide blocks and said movable formers for causing said movable formers to be radially outwardly displaced successively to define successive spaces between themselves and bottoms of the slots in response to axial movement of said splined shafts, whereby the coil turns can be inserted into said spaces as successive layers in the slots.

4,520,966

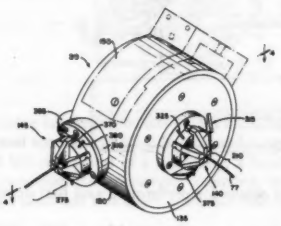
WIRE CANISTER FOR A ROBOTIC WIRE HARNESS ASSEMBLY SYSTEM

Joseph T. Bloch, and Dan A. Cross, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 7, 1983, Ser. No. 539,768

Int. Cl.³ B65H *75/00;* **B25G** *3/22*

U.S. Cl. 242—54 R **10 Claims**



1. A transportable canister for accepting, storing and dispensing a wire segment to be used by a robot during the assembly of a wire harness, comprising:

a cylindrical housing having an access opening for a wire,

a cylindrical drum disposed within said housing, the outer surface of said drum being provided with a wire-accepting helical groove and a wire inlet opening,

means for enabling said drum to rotate with respect to said housing,

a drive plate attached to said drum whereby a rotation of said drive plate effects a rotation of said drum, said drive plate being provided with a wire outlet opening,

a wire guide tube disposed within said drum and extending between said inlet opening and said outlet opening,

means forming a first releasable clamp for constraining and centering the leading end of said wire segment, said first clamp means being disposed at said outlet opening, and

means forming a second releasable clamp for constraining and centering the trailing end of said wire segment, said second releasable clamp means being disposed at said access opening;

whereby in use said drive plate and thus said drum may be rotated to initially align said inlet opening with said access opening and subsequently wind said wire into said groove.

4,520,967

DEVICE FOR A ROLL SPINDLE

Bengt A. Andreasson, Åmål, Sweden, assignor to Aktiebolaget Amals Mekaniska Verkstad, Amal, Sweden

Filed Dec. 13, 1983, Ser. No. 560,876

Claims priority, application Sweden, Dec. 20, 1982, 8207249

Int. Cl.³ B65H *75/24*

U.S. Cl. 242—55 **5 Claims**

1. Device for a roll spindle for unwinding or winding up a web material, said device comprising:

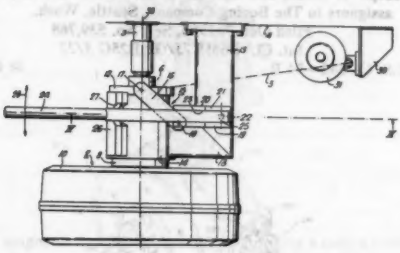
a mechanism having a central axis and being operatively

connected to a roll spindle for developing a torque upon said roll spindle, said roll spindle having a longitudinal axis defining an axial direction;

a clutch between said roll spindle and said mechanism for operatively connecting said roll spindle and said mechanism;

an articulated joint including a link extending between a first and a second hinge joint, said first hinge joint being connected to said mechanism;

means for performing first and second operations in said axial direction, said first operation causing said mechanism to move towards or away from said roll spindle in said axial direction for engagement and disengagement, respectively, of said mechanism and said roll spindle, said second operation causing said mechanism when connected with said roll spindle to move in said axial direction, said means for performing said first operation comprising:



means for displacing said second hinge joint relative to said first hinge joint,

means for preventing said mechanism from significantly rotating about said central axis when said second hinge joint is displaced relative to said first hinge joint, whereby said mechanism is caused to move in its axial direction, said means for performing said second operation comprising:

locking means for locking said second hinge joint such that said second hinge joint remains essentially stationary during said second operation, and

means for rotating said mechanism about said central axis when said second hinge joint is locked by said locking means, such that said articulated joint forces said mechanism to move in said axial direction.

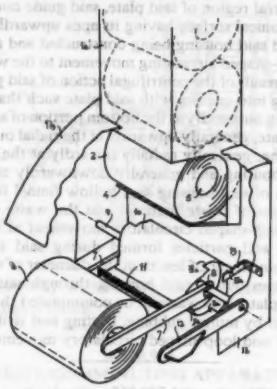
4,520,968

DISPENSING DEVICE FOR CYLINDRICAL BODIES, SUCH AS ROLLS OF TOILET PAPER, PAPER TOWELS AND THE LIKE

David Shpigelman, 1 Mavo Gilat, Ramath Zahla, Tel Aviv, Israel

Filed Oct. 20, 1983, Ser. No. 543,906
Claims priority, application Israel, Oct. 20, 1982, 67028
Int. Cl.³ B65H *19/04*
U.S. Cl. 242—55.3 **5 Claims**

1. A dispensing device for cylindrical bodies, such as rolls of toilet paper, paper towels and the like, said device comprising a magazine in which a vertical stack of rolls is positionable with the axes of the rolls normal to the vertical extension of the stack, a dispensing and holding mechanism being positioned below the said stack, said mechanism comprising a cylindrical body mounted within said magazine and arranged below the stack and having a central axle, two arms extending radially relative to said cylindrical body, a tension spring fixed to each of said arms and biasing said arms toward one another, said cylindrical body having a pair of opposite circular ends each forming a number of cam paths, said arms being hingedly mounted on said axle and being angularly movable towards and away from one another, said arms each having a free end spaced outwardly from said axle and each free end mounting a stud oppositely directed to said stud on the other said arm, said studs adapted to enter a hollow reel of a roll, each said arm



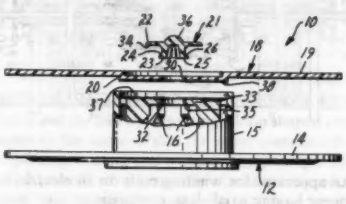
extending across and in contact with one of said cam paths and being urged towards the other said cam paths by said tension spring and means for imparting rotative movement to the said cylindrical body about said central axle.

4,520,969

VIDEOCASSETTE TAPE SPOOL HAVING A WEAR BUTTON

James J. Wulfing, Afton, and Robert M. Rood, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 17, 1983, Ser. No. 542,430
Int. Cl.³ B65H *75/18*; G03B *1/04*; G11B *15/32*
U.S. Cl. 242—71.8 **8 Claims**



1. Tape spool for a tape cassette, which spool comprises a flanged hub having a cylindrical tape-winding surface and a wear button projecting beyond the flanged hub at the axis of the spool, wherein the improvement comprises:

a first piece including one flange and said hub, said hub including a radial wall defining a circular central opening;

a disk which completes said hub to provide the other flange and thereby define said flanged hub, said disk including a circular central opening coaxial with said first piece central opening; and

a separate piece bearing said wear button and including a collar having an inner face which fits flush against said disk, and an outer face opposite said inner face; at least two detents projecting from said inner face of said collar and through said coaxial circular central openings in said disk and said first piece to lock to said radial wall of said hub with said disk interposed between said collar and said hub to retain said disk adjacent said hub; and a protuber-

ance on said outer face of said collar which defines said wear button;

said central openings of said disk and said hub being circular to permit assembly of said disk to said hub and assembly of said separate piece to said hub through said disk without any particular radial orientation of said hub, disk or separate piece.

4,520,970

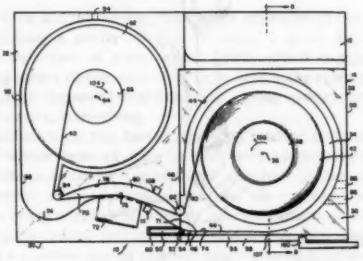
CARTRIDGE TAPE DRIVE HAVING VACUUM AUTO-THREADING

Donald O. Rasmussen, Arcadia; William C. Chow, West Covina, and Franklin J. Davio, Burbank, all of Calif., assignors to Kennedy Company, Monrovia, Calif.

Filed Oct. 3, 1983, Ser. No. 538,426

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—195 **20 Claims**



4. An auto-threading magnetic tape drive for use with a removable tape cartridge comprising:

a base;

a take-up reel rotatably mounted on the base;

a magnetic head assembly mounted on the base;

means defining a generally enclosed continuous flowpath along the base between an upstream portion of the flowpath and the take-up reel and extending past the magnetic head assembly;

a cartridge having a generally enclosed housing and a supply reel mounted within the housing, the supply reel having a length of magnetic tape wound thereon and terminating in a leading end, the housing having a tape exit port through which the leading end of the length of magnetic tape may exit the housing and an air intake port;

means for releasably mounting the cartridge on the base with the tape exit port at the upstream portion of the flowpath;

means mounted on the base for selectively rotating the supply reel and the take-up reel; and

vacuum means for drawing air through the air intake port and through the housing, the tape exit port and the flowpath to pull the leading end of the length of tape from the supply reel to the take-up reel as the supply reel is rotated by the means for selectively rotating to unwind the tape therefrom;

the means for selectively rotating the supply reel and the take-up reel including a motor coupled to the base, a drive pulley mounted on the motor, an idler pulley movably mounted on the base, means normally biasing the idler pulley for movement in a direction away from the drive pulley, an endless belt encircling the drive pulley and the idler pulley, and a driven pulley disposed at the bottom of the housing of the cartridge and coupled to the supply reel, the driven pulley being operative to engage the endless belt between the drive pulley and the idler pulley when the cartridge is mounted on the base by the means for releasably mounting so as to be driven by the motor via the drive pulley and the endless belt.

4,520,971

FISHING REEL

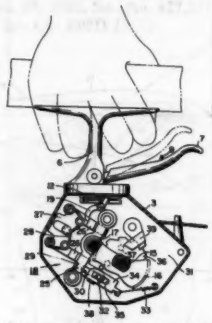
Hiromitsu Nagata, Tokyo, Japan, assignor to Daiwa Seiko Inc., Tokyo, Japan

Filed May 28, 1982, Ser. No. 383,231

Claims priority, application Japan, Jul. 3, 1981, 56-99241; Nov. 27, 1981, 56-190214[U]

Int. Cl.³ A01K *89/02*

U.S. Cl. 242—220 **2 Claims**



1. A double bearing type fishing reel including a spool shaft with a spool mounted fixedly thereon and supported between right and left side plates of a reel body, a handle shaft, and a clutch mechanism for operatively coupling, and uncoupling, said handle shaft and said spool shaft, said fishing reel comprising:

a reel mounting leg having a fishing rod mounting member, said leg being fastened between upper portions of said side plates,

an operating lever connected pivotably to a base portion of said reel mounting leg and having an operating portion opposed to a lower front portion of said fishing rod mounting member,

a pivotable member engaged with an end of said operating lever above said spool in such a manner that said pivotable member can be turned horizontally,

operating means, projecting from a circumferential portion of said pivotable member, for actuating said clutch mechanism to render said spool freely rotatably, spool braking means engagable with said operating means for braking the rotation of said spool,

and a cam formed on a lower surface of said pivotable member and adapted to actuate said spool braking means.

4,520,972

SPIN-STABILIZED TRAINING MISSILE

Walter Diesinger, Bergisch-Gladbach, and Axel Homburg, Taunusstein-Wehen, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jun. 7, 1982, Ser. No. 386,072

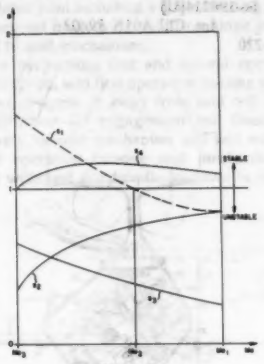
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122320

Int. Cl.³ F42B *13/20*

U.S. Cl. 244—3.1 **15 Claims**

1. A spin-stabilized training missile which comprises a base member shaped as a missile with a stabilizer means for reducing spin in order to decrease the flight range, the base member of the training missile, upon firing, having a stability due to spin that is too low for stable flight, and said stabilizer means comprises at least one element having a stabilizer surface which effects, on the one hand, an additional aerodynamic stabilization providing stable flight in the training range together with the spin stabilization of te base member and, on the

other hand, after leaving the training range, such a spin reduction that the training missile becomes unstable; the stabilization attainable by spin upon firing of the training missile base member, without the stabilizer means, is defined by a stability factor



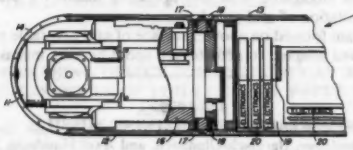
$s<1$, said stabilizer means, which is mounted behind the center of gravity of said base member, initially compensating for the lack of stability of the base member and then generating a longitudinal moment which brakes the rotation of said training missile.

4,520,973

STABILIZED GIMBAL PLATFORM

Keith E. Clark, and Charles E. Woods, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 11, 1983, Ser. No. 484,050
Int. Cl.³ F42B *15/02*; F41G *7/22*
U.S. Cl. 244—3.16 **12 Claims**



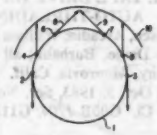
1. A rate gyro stabilized gimbal tracking system comprising:
a support frame with counterweight assembly;
a platform mounted on said support frame;
a two-axis gimbal ring on said support frame mounted to said platform;
at least one rate gyro connected to said platform;
a lens system with a characteristic focal length and focal point attached to said platform;
a sensor mounted on said platform spaced from said lens system at the focal point of said lens system;
a light level control assembly connected to said sensor;
a bail connected to one axis of said two-axis gimbal ring;
a bail drive assembly mechanically connected to said bail; and
an electronic control assembly connected to said rate gyro and bail drive assembly.

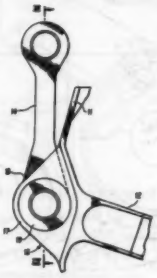
4,520,974

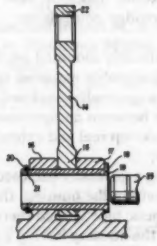
COMBINED FASTENING DEVICE FOR TRANSPORTING AND HOISTING A TURBOJET ENGINE

Pierre Debeneix, Saint Sauveur sur Ecole, France, assignor to S.N.E.C.M.A., Paris, France

Filed Mar. 8, 1983, Ser. No. 473,204
Claims priority, application France, Mar. 8, 1982, 82 03807
Int. Cl.³ B64D *27/00*
U.S. Cl. 244—54 **3 Claims**





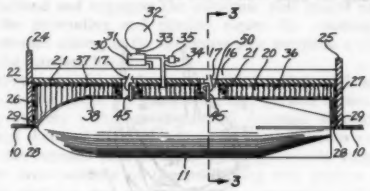


1. A combined fastening device for transporting and hoisting a turbojet engine into an airframe, said device comprising:
two first straps, each said first strap being positioned at the intersection of a housing of said engine with the horizontal diameter thereof, each said first strap having spaced first fixing lugs including coaxial first bores;
a rod for each said first strap, each said rod having one end positioned between said first fixing lugs, said one end having a first hole coaxial with said first bores, each said rod having a second end including a second hole adapted to receive engine hoisting means associated with said airframe;
a sleeve inserted between each said first bores and first holes, the interior or each said sleeve being adapted to receive engine transporting means,
said engine transporting means comprising:
a pin insertable in said sleeve;
a transport truck having an arm for each said first strap; and
a second strap on each said arm, each said second strap having second fixing lugs including second bores positionable coaxial with said first bores, whereby each said pin can be simultaneously inserted in one said sleeve and said second bores.

4,520,975
AIR-BAG EJECTION SYSTEM FOR STORE DEPLOYMENT

William R. Blackhurst, Toluca Lake, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Dec. 6, 1982, Ser. No. 447,223
Int. Cl.³ B64D 1/02; F41F 5/02
U.S. Cl. 244—137 R 1 Claim



1. For an aircraft having through its envelope an open section forming a cavity adapted to carry a store suspended therein by means of store release hooks which engage lugs forming a part of the store, and from which the store can be released, an improved dual condition air-bag system arranged in said cavity, comprising:

an inflatable air-bag having opposing interior surfaces, one of which forms an outer surface, having a plurality of ties with each tie having one end attached to one of said interior surfaces of said air-bag and the other end of each tie being attached to another interior surface of said air-bag for causing said surfaces of said air-bag to be displaced to a positive spaced relation relative to each other upon inflation of said air bag;

said air-bag being arranged in the cavity of said aircraft to permit insertion of a store into said cavity, and to cause the outer surface to be expanded into substantial conformity with the envelope of the aircraft;

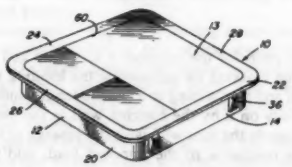
said air-bag having at least one air-tight passage extending through said air-bag to provide clearance for lugs of the store to pass through for engagement with the release hooks; and

said air-bag system further comprising spring cleat means in said passage to automatically open and close said passage.

4,520,976
CABLE BUSHING

Bernard T. Cournoyer, Holden, and Norman A. Hedstrom, Worcester, both of Mass., assignors to Wright Line Inc., Worcester, Mass.

Filed Mar. 25, 1982, Ser. No. 361,640
Int. Cl.³ F16L 5/00
U.S. Cl. 248—56 15 Claims

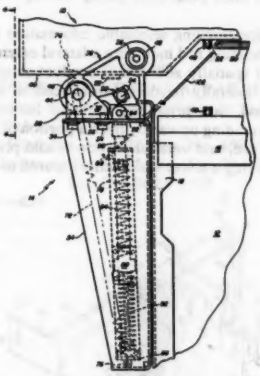


1. A cable bushing comprising a frame portion, and a filler portion, said filler portion being disposable on said frame portion and including a body portion, and at least one flap hingedly connected to said body portion, said flap movable to a first position in which it is coplanar with the body portion and a second position in which the flap is disposed within said frame portion thereby providing an opening therethrough, said frame portion being adapted to occupy an opening in a structure and being further adapted to receive a cable therethrough.

4,520,977
APPARATUS FOR MOUNTING A DOCUMENT FEEDER ON A COPIER/DUPLICATOR

Ronald C. Holzhauser, Holley; James A. McGlen, and Gary P. Lawniczak, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,237
Int. Cl.³ E05D 13/12
U.S. Cl. 248—201 11 Claims



1. In apparatus for mounting a document feeder on a copier/duplicator or the like for movement between a first position adjacent an exposure station of the copier/duplicator and a second position spaced from the exposure station, the improvement comprising:

means pivotally mounting the feeder on the copier/duplicator (1) for movement about a first axis during initial movement of the feeder away from the exposure station and (2) for movement about a second axis during subsequent movement of the feeder away from the exposure station, the first and second axes being offset from the exposure station with the second axis being further from the exposure station than the first axis, and

stop means associated with the mounting means for stopping movement of the feeder about the first axis after the feeder has moved through a first lift angle; and counter-balance means coupled to the feeder to facilitate movement of the feeder between its first and second positions.

4,520,978
DISPLAY HANGER

Ronald H. Taub, 230 E. Ohio St., Chicago, Ill. 60611

Filed Jun. 21, 1982, Ser. No. 390,384
Int. Cl.³ A47F 5/00
U.S. Cl. 248—220.4 1 Claim

1. A hanger adapted for increasing the merchandise carrying capacity of a product display comprising:

a body including connector means adjacent the bottom thereof, a vertical extension rod rising vertically upward from said connector means, and a product support rod extending laterally outward adjacent the top of said vertical extension rod;

said connector means being selectably engaged with a product display stand to maintain the hanger in mounted position thereon;

said vertical extension rod being a height greater than the height of the largest desired package to be positioned on said product support rod, said product support rod being

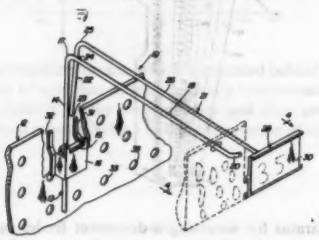
a length sufficient for mounting a desired number of packages in dependent fashion thereon;

said vertical extension rod and said product support rod being made of one elongated rod having a first elbow intermediate opposing ends of said rods defining a boundary therebetween to define said vertical extension rod and said product support rod such that said first elbow connects said opposing ends thereof;

said connector means including a pair of spatially related, substantially parallel finger-like projections adapted for positioning in adjacent apertures in a pegboard-type panel, said finger-like projections each including a stepped portion thereon for retention of said finger-like projections on said panel once positioned partly through the apertures thereof;

a price rail for carrying selectable information thereon;

a price rail-holding rod including a lateral extension portion positioned spatially above said product support rod and extending laterally beyond a distal end of said product support rod, said price rail rod also having a vertical portion extending upwardly from a portion of said vertical extension rod, said vertical portion of said price rail-holding rod having a lower end fixedly secured to said portion



of said vertical extension rod for firm and fixed connection therewith;

said vertical portion of said price rail-holding rod extending upwardly from said portion of said vertical extension rod in an imaginary plane forming an acute angle with an imaginary plane in which said vertical extension rod extends, so that said lateral extension portion of said price rail-holding rod is spaced laterally from said product support rod and substantially parallel thereto along at least most of the length of said lateral extension portion of said price rail-holding rod;

said vertical portion being tilted forward with respect to said vertical extension rod such that an upper portion of said vertical portion projects above a portion of said product support rod, which portion of said product support rod is spaced from said first elbow defining the boundary between said product support rod and said vertical extension rod in a direction away from said connecting means; said vertical portion also being fixedly connected to said portion of said product support rod at a laterally adjacent section of said vertical portion, whereby said vertical portion is permanently affixed to said elongate rod at two spaced portions thereof on each side of said first elbow.

4,520,979

HANGER AND METHOD FOR SUSPENDING A TELEVISION

Donald E. McInnis, 1611 Elwood Dr., Los Gatos, Calif. 95030

Filed Mar. 29, 1982, Ser. No. 362,834

Int. Cl.³ F16M *13/02*

U.S. Cl. 248—323 **2 Claims**

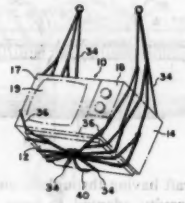
1. A suspender for suspending a television set from the ceiling and wherein the set has a center of gravity and includes top, bottom, side, front and back walls and includes a handle and a cord bracket fixed to one wall, said suspender comprising:

a cradle having a geometrical center and being sized to receive and support the television set;

a plurality of supporting ropes extending two opposite directions from the cradle and upward along the side walls of the set;

one or more ropes extending from said cradle and upward along the edge of the front wall of the set;

one or more ropes extending from said cradle and upward along the back wall of the set;



said ropes being sized to permit the positioning of the cradle adjacent the bottom wall of the set with the geometric center thereof formed of the center of gravity of the television set to allow a forward tilting of the set for better viewing of the front wall thereof;

means to attach the extending ends of said ropes to the ceiling; and

a safety cord having one end fixed to said cradle and the other end fixed to the set to prevent the set from rolling off the cradle and falling to the floor.

4,520,980

ELONGATE COMPRESSION BEARING MEMBER

Rodney C. Townsend, Johannesburg, South Africa, assignor to Mine Support Systems (Proprietary) Ltd., South Africa

Filed Nov. 3, 1980, Ser. No. 203,791

Claims priority, application South Africa, Nov. 2, 1979, 79/5882

Int. Cl.³ E04G *25/00*

U.S. Cl. 248—351 **5 Claims**

1. A mine prop for use between a foot wall and a hanging wall in a mine working for supporting the hanging wall above the foot wall and for yielding to a shorter length under the load imposed axially on it by the hanging wall as the hanging wall descends towards the foot wall with the passage of time, while still offering resistance to the imposed load, said mine prop comprising:

(a) columnar timber pole means of substantially uniform cross-section and extending over a major portion of the length of the prop for resisting loads without significant compression thereof;

(b) integral timber protruding end portion means axially adjacent one end of the columnar pole means for compressive yielding under the imposed loads from an initial length to a lesser length, the protruding end portion mean

extending over a minor portion of the length of the prop and tapering from its end adjacent the columnar pole means to its remote end;

(c) the cross-section of the protruding end portion means adjacent the columnar means being less than that of the columnar pole means so that there is a clearly defined shoulder between the protruding end portion means and the columnar pole means;

(d) a restraining ring around the columnar pole means around and engaging the columnar pole means adjacent the protruding end portion means for resisting hoop stresses arising in the columnar pole means as a result of the imposed loads;

whereby upon the application of the hanging wall imposed loads on the prop, the protruding end portion means yields compressively with a corresponding decrease in length, the tapered shape of the protruding end portion means ensuring that the imposed load is taken by progressively larger and larger cross-sections of the protruding end portion means during yielding, and whereby, after compressive yielding of the protruding end portion means has taken place, the imposed load is taken by the columnar pole means until collapse of the prop takes place.

4,520,981

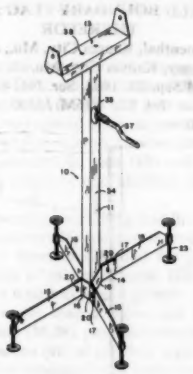
ADJUSTABLE TELESCOPIC SUPPORT

Marvin Harrigan, Elk Grove Village, Ill., assignor to Marvco Tool & Mfg. Inc., Elk Grove, Ill.

Filed May 23, 1983, Ser. No. 497,096

Int. Cl.³ F16M *11/00*

U.S. Cl. 248—413 **8 Claims**



1. An adjustable vertical support comprising;

(a) a square shaped standard having a hollow core,

(b) a base for said standard for supporting the same in a vertical position,

(c) an elongated U-shaped supporting means movable vertically within the hollow core of said standard,

(d) said U-shaped supporting means providing a pair of parallel arms, one edge of each arm being tapered throughout its length so as to provide therebetween an inclined medial face portion,

(e) said parallel arms providing at their free elongated margins parallel straight edges adapted to have sliding contact with the inner wall surface of one wall of said hollow core of said standard so as to maintain said supporting means in axial alignment with said hollow core as it moves therethrough,

(f) said medial face portion of said U-shaped supporting means adapted to be spaced from a confronting inner wall surface of said hollow core of said standard when said supporting means is movably positioned therein, and

(g) means provided by said standard and adjustably projectable through said one confronting inner wall surface into binding contact with said inclined medial face of said supporting means for restraining vertical movement of said supporting means in one direction into said said standard while permitting free movement of said supporting means in an opposite direction out of said standard.

4,520,982

SLIDE ADJUSTMENT APPARATUS

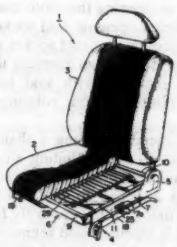
Takaichi Nishino, Tokyo, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1983, Ser. No. 458,150

Claims priority, application Japan, Jan. 29, 1982, 57-11721

Int. Cl.³ B60N *1/08*

U.S. Cl. 248—430 **2 Claims**



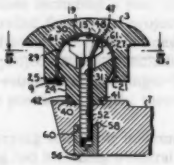
1. A slide adjustment device for adjusting forward and backward sliding movement of vehicle seats, said device comprising a lower rail which is adapted to be attached to a floor of said vehicle, an upper rail which is adapted to be attached to the frame of said seat and which is slidably movable within said lower rail, and a sliding element which is adapted to slide in relation to both of said upper and lower rails and which is positioned substantially between said upper and lower rails, said device further comprising a plurality of rolling members which are rotatably positioned at least partially within said sliding element and which comprise means for causing said sliding element to slide between said rails, each of said roller members being comprised of resin and having a solid cross-sectional area which has a dimension which is less than the width of said sliding element, said rolling members being positioned adjacent front and rear portions of said sliding element, respectively, said upper rail having a lowermost portion which comprises a substantially horizontal flange, a vertical wall, and having a generally U-shaped cross-sectional configuration, said horizontal flange forming one leg of said upper rail, said rolling members rotatably contacting a lower surface of said horizontal flange, said lower rail having a generally rectangular cross-sectional configuration, an inner lower surface, an upper wall having an opening, and a substantially vertical wall, said upper rail flange and at least a portion of said upper rail vertical wall being positioned within said opening, said rolling members also rotatably contacting said inner lower surface and said sliding element contacting said vertical wall, said adjustment device further comprising an adjustable locking mechanism attached to said frame and comprising means for locking said seat in a predetermined fixed position, said upper rail being attached to a side frame portion of said seat.

4,520,983

MIRROR ASSEMBLY

Arthur R. Templeman, Overland Park, Kans., assignor to Peterson Mfg. Co., Grandview, Mo.

Filed Nov. 3, 1981, Ser. No. 317,835
Int. Cl.[3] A47G *1/24*
U.S. Cl. 248—481 2 Claims



2. An expandable ball and socket arrangement comprising:

(a) a housing;

(b) a socket extending into said housing and having an opening thereinto; said socket exhibiting a surface having a lug extending outwardly therefrom;

(c) a socket liner retained in said socket; said socket liner defining a cavity and comprising a generally thin-walled member having an opening thereinto coaxial and coextensive with said socket opening; said socket liner exhibiting an inner surface contacting said socket surface;

(d) said socket liner defining an aperture therethrough; said aperture being mateable with said lug, whereby said socket liner is inhibited from rotating relative to said socket;

(e) an expandable member having a shank and a head received in said cavity and including an axial passageway therethrough; said head comprising a plurality of laterally spaced segments attached to said shank; said segments being resiliently deformable outwardly from a central axis of said expandable member; said segments each exhibiting at an extremity of said passageway opposed to said shank a beveled face diverging axially outwardly toward said passageway extremity; and

(f) a draw bolt extending through said expandable member passageway, said bolt including at an end thereof adjacent said expandable member segments a head exhibiting a beveled surface mateable with said segment beveled faces; said bolt including at another end thereof means to draw said draw bolt through said axial passageway in a direction from said segments toward said shank such that said draw bolt head beveled surface and said segment beveled faces are forced into interengagement, whereby said individual segments are deformed outwardly into frictional engagement with said socket liner.

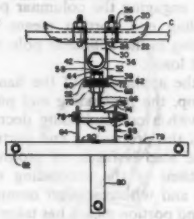
4,520,984

HANGING BRACKET FOR SUSPENDING OVERHEAD SIGNS

Robert J. Rouleau, 28 Cedar Knoll Rd., Cockeysville, Md. 21030

Filed May 5, 1983, Ser. No. 491,706
Int. Cl.[3] G09F *7/22*
U.S. Cl. 248—489 1 Claim

1. In a system for suspending overhead signs and having: cable clamping means, means for setting lateral angle of a sign in the plane of a cable, means for fixing facing-direction of a sign about a substantially vertical axis including a horizontal arm attached below the means for setting; means permitting swinging of a sign in the plane of the facing direction, including a sleeve, a pivot bolt in the sleeve and arm structure connected with the pivot bolt and sleeve, the improvement comprising: the means for fixing facing-direction including an inverterd "T"-shaped member including a shank in the form of a vertical locking bolt having a threaded upper end proportioned for receiving thereon: said horizontal arm, a backing member, a nut for securing together said horizontal arm and backing member; said shank having thereon a structure for wrenching, said sleeve being affixed transversely on the lower end of said vertical locking bolt, means for minimizing wear of said means permitting swinging including a unitary thermoplastic bushing, said thermoplastic bushing secured within the bore of said sleeve and having a portion protruding from each end thereof in position for bearing on said arm structure, locking means between said horizontal arm and backing member, said locking means being an external-tooth lock washer, said structure for wrenching comprising a nut welded on a part of the threaded upper end below said backing member, said backing member being a backing plate welded to said nut welded on said part of the threaded upper end, and said structure for wrenching further comprising said vertical locking bolt having at said lower end a faceted head.

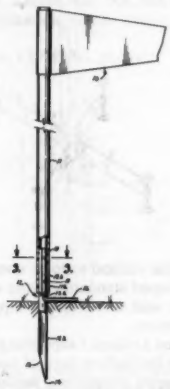


4,520,985

PLAYING FIELD BOUNDARY FLAG AND SUPPORT THEREFOR

Lawrence S. Blumenthal, Kansas City, Mo., assignor to Gelhaar Uniform Company, Kansas City, Mo.

Filed Sep. 22, 1982, Ser. No. 421,410
Int. Cl.[3] F16M *13/00*
U.S. Cl. 248—530 4 Claims



1. A ground insertable support for a playing field boundary marking flag mounted on a flexible staff having a hollow mounting end,

said support comprising

a ground engaging member having a blade portion tipped at one end for insertion in the ground and having a hollow shaft portion extending from the other end of the blade portion in general alignment with the lengthwise direction of the blade portion and adapted to be fitted inside said hollow mounting end of the flexible flag staff,

a rod having a first portion- confined in said hollow shaft, said rod including a second portion bent laterally away from

the axis of the first portion and extending through an opening in said ground engaging member located near the juncture of said blade portion and said shaft portion,

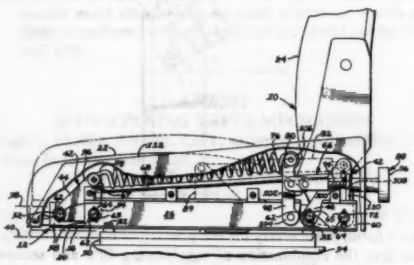
said second portion of said rod providing surfaces respectively for application of pressure to drive the blade portion into the ground and for limiting the maximum depth of penetration to keep the shaft portion above ground level.

4,520,986

SUSPENDED SEAT ASSEMBLY

Lawrence A. Liljequist, Chesterland; John E. Wible, Painesville, and Richard A. Schwehr, Mentor, all of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jan. 10, 1983, Ser. No. 456,686
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—585 **18 Claims**



1. In a suspended seat assembly (10) having a seat frame (12) and a support frame (14), said seat frame (12) having first and second spaced apart sides (16,18) and said support frame (14) having first and second spaced apart support members (26,28); said first side (16) and first support member (26) being adjacent one another, and said second side (18) and second support member (28) being adjacent one another; the improvement comprising:

means (42) for pivotally connecting said first side (16) to said first support member (26) and said second side (18) to said second support member (28) and for permitting elevational movement of said seat frame (12) between a first position (38), at which at least a portion of said seat frame (12) is elevationally spaced above said first and second support members (26,28), past said support frame (14) and to a second position (40) at which at least a portion of said seat frame (12) is located elevationally below said first and second support members (26,28), said pivotal connecting means including first, second, third and fourth support links (44,46,48,50), said first and second links (44,46) being pivotally connected to said first side (16) at spaced apart locations and pivotally connected to said adjacent first support member (26) at spaced apart locations, and said third and fourth links (48,50) being pivotally connected to said second side (18) at spaced apart locations and pivotally connected to said adjacent second support member (28) at spaced apart locations;

means (66) for maintaining the first and second sides (16,18) at a preselected attitude relative to the respectively adjacent first and second support members (26,28); and

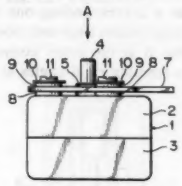
means (74) for biasing said pivotal connecting means (42) and urging said seat frame (12) to said first position (38), said biasing means (74) includes a first resilient member (76) connected to one of said links (44,46,48,50) and an adjacent one of said first and second support members (26,28), said first resilient member (76) being spaced outwardly from the adjacent one of said first and second sides (16,18), elevationally above the adjacent one of said first and second support members (26,28), and substantially between a plane (90) extending vertically from the adjacent side (16,18) and a plane (92) extending vertically from the adjacent support member (26,28).

4,520,987

STRUCTURE OF SUPPORTING A STEPPING MOTOR

Yasukata Eguchi; Susumu Hanyu; Hideaki Takenoya, and Mikio Inamori, all of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Jun. 17, 1982, Ser. No. 389,231
Claims priority, application Japan, Jun. 15, 1981, 56-86797[U]
Int. Cl.³ F16M *1/00*
U.S. Cl. 248—635 **3 Claims**



1. A mounting for supporting a stepping motor of a machine, the stepping motor having an electric input pulse stepwise rotated rotor shaft rotatably arranged in a housing and partly projecting out of the housing through a bearing provided on one face of the housing, comprising:

a plurality of inner threaded mounts attachable to the one face of the housing radially of the bearing;

cushion means formed to surround each of said mounts;

a support plate having a plurality of openings adapted to receive said mounts and cushion means with a radial clearance while said cushion means clamps a portion of said support plate surrounding each of said holes, a separate single opening formed to receive the bearing, and one of said plurality of openings being formed so that the housing is prevented from moving angularly with respect to said bearing receiving opening; and

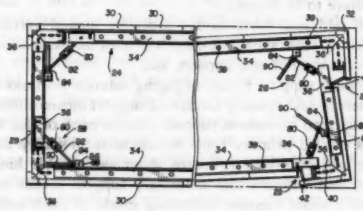
fastening means including washer means oriented to press against said cushion means as a fastening screw is screwed into each of said mounts causing said cushion means to clamp said support plate between said washer means and the housing.

4,520,988

CONCRETE CORE-WALL FORM AND STRIPPING ASSEMBLY THEREFOR

Eugene P. Walker, N. Bergen, N.J., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Apr. 23, 1984, Ser. No. 602,891
Int. Cl.³ E04G *15/06*; B28B *7/30*
U.S. Cl. 249—13 **15 Claims**



1. An inwardly articulated form assembly for forming a rectangular shaped concrete core-wall structure comprising:

a primary form having exterior wall faces and corners defining a rectangle corresponding to said concrete core-wall structure to be formed,

each of said wall faces having a vertically extending seam such that there is at least one seam adjacent each of said corners, and

a secondary support means engaging interior portions and corners of said primary form, said support means having a double hinge means corresponding to each seam and operable for effecting a compound movement of said support means to cause each of said wall faces of said primary form to articulate inwardly away from said core-wall structure about said double hinge means, each double hinge means having two pivot axes disposed along and inwardly from a corresponding one of said wall faces, each double hinge means disposed closer to a corresponding corner than it is the other corners, said secondary support means forming rigid angles at the corners.

4,520,989

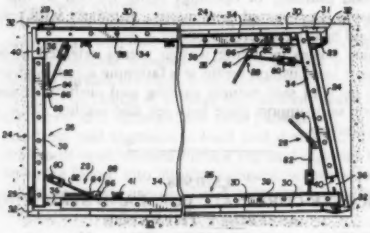
CONCRETE CORE-WALL FORM AND STRIPPING ASSEMBLY THEREFOR

Frank Digh, Davidson, N.C., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Apr. 23, 1984, Ser. No. 602,892

Int. Cl.³ E04G *15/06*; B28B *7/30*

U.S. Cl. 249—13 **18 Claims**



1. An inwardly articulated form assembly for forming a rectangular shaped concrete core-wall structure comprising:

a primary form having exterior wall faces and corners defining a rectangle corresponding to said concrete core-wall structure to be formed,

each of said wall faces having a double hinged vertically extending seam such that there is at least one seam closely adjacent each of said corners, and

a secondary support means engaging interior portions and corners of said primary form, said support means effecting a compound movement thereof to cause each of said wall faces of said primary form to articulate inwardly away from said core-wall structure about said double hinged seam, and wherein said secondary support means comprises a waler member extending inside of each wall of said primary form in a plane normal thereto and an extension member extending from an associated waler member, each waler member extending for affixation to the extension member associated with an adjacent waler member.

4,520,990

DEVICE FOR SEPARABLY CONNECTING NEIGHBORING PANELS IN CONCRETE FORMS

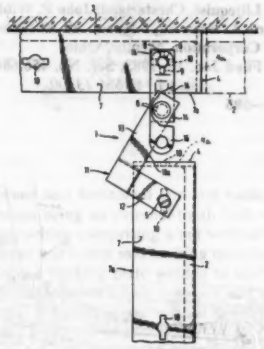
Josef Maier, Schwimmbadstr 3, D-7611 Steinach, Fed. Rep. of Germany

Filed Mar. 30, 1983, Ser. No. 480,414

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213482

Int. Cl.³ E04G *11/10*

U.S. Cl. 249—47 **26 Claims**



1. In a form, particularly for the pouring of concrete ceilings or the like, the combination of neighboring first and second panels respectively having aligned first and second flanges and prefabricated openings in such flanges; and a device for separably connecting said panels, comprising a first section including a first projection removably received in an opening of said first flange, a second section including a second projection removably received in an opening of said second flange, and means for movably coupling the first and second sections to each other so that one of said panels and the respective section can be moved with reference to the other panel and the respective section.

4,520,991

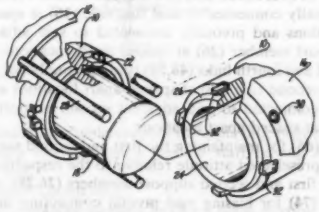
APPARATUS FOR MAINTAINING UNIFORM WALL THICKNESS IN HOLLOW MOLDED PLASTIC ARTICLES

Ilija Letica, 1700 W. Hamlin Rd., Rochester, Mich. 48063

Filed Mar. 8, 1984, Ser. No. 587,588

Int. Cl.³ B29C *1/00*; B29F *1/022*

U.S. Cl. 249—122 **4 Claims**



1. Apparatus for maintaining a diametrically uniform wall thickness in a hollow molded plastic article such as an open-ended container comprising:

a male mold element having a first exterior portion defining the interior configuration of the article and a second exterior portion defining a striking surface;

a female mold element having a first interior portion defining

the exterior configuration of the article and a second exterior portion defining a second striking surface;

said male and female elements being telescopically interfitting with one another along a common axis with said exterior and first interior portions in spaced apart relation to define a mold cavity for said article and with the first and second striking surfaces in mutual engagement;

a plurality of axially extending guide blocks mounted on one of said mold elements in circumferentially spaced relation adjacent the striking surface thereof;

a plurality of pockets formed in the other of said mold elements adjacent the striking surface thereof and in axially alignment with said guide blocks, each of said pockets having a pair of opposing, interior side surfaces; and

first and second reversely similar wear plates mounted within each of said pockets adjacent the opposing side surfaces thereof to define precise openings of a circumferential width closely conforming to the circumferential width of the guide blocks;

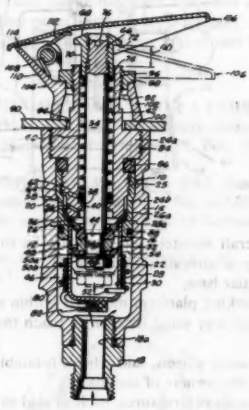
thereby to permit telescopic interfitting of said male and female mold elements in an axial alignment which produces a uniform radial thickness of said mold cavity about said axis.

4,520,992

SLOW-CLOSING VALVE MECHANISM

Ralph L. Sheffer, Arcadia, Calif., assignor to Adams Rite Products, Inc., Glendale, Calif.

Filed Jun. 22, 1983, Ser. No. 506,736
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—48 **15 Claims**



1. A slow-closing valve mechanism for controlling the communication between main inlet and outlet liquid flow passages in a valve housing comprising:

a cylinder forming a timing chamber having a valve seat at one end and an inwardly adjacent main flow inlet, and a bleeder opening at its opposite end;

a valve stem extending through said valve seat into said chamber;

a piston on the end of said stem in the chamber;

a valve member on said piston movable into seated and non-seated relation with said seat;

means normally biasing said piston and said valve member in a direction toward said valve seat;

means for manually moving said piston and said valve member in a direction away from said seat; and

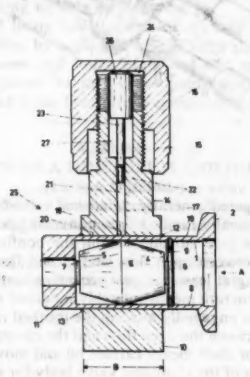
means comprising an elongate capillary tube having convolutions adjacent said opposite end and providing a fixed hydraulic flow passage for controlling flow through said bleeder opening, the inlet end of said tube being in communication with said main inlet flow passage, and the outlet end of said tube being connected with said bleeder opening.

4,520,993

METERING VALVE

Siegfried Schertler, In der Au 6, CH9469 Haag, Switzerland

Filed Dec. 27, 1983, Ser. No. 565,615
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1982, 3248150
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—57 **14 Claims**



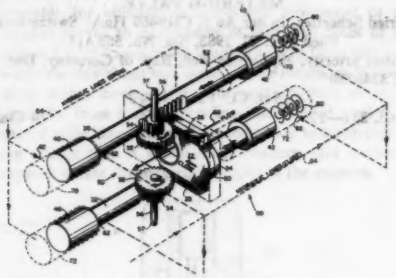
1. Metering valve for use in high vacuum installations comprising a valve housing, a valve body located within said valve housing, said valve body is rotationally symmetrical about a first axis, said valve housing including an axially extending elastically deformable tubular member having an outside surface and an inside surface with the axis of said tubular member being coaxial with the first axis of said valve body, said valve body having an active metering position and in the active metering position said valve body is located in said tubular member, a sleeve member laterally enclosing said tubular member at least in the axially extending region containing the active metering position of said valve body, said sleeve member is tightly sealed to said tubular member, at spaced locations in the axial direction of said tubular member, said sleeve member has an inside surface in closely fitting relation with the outside surface of said tubular member so that a joint is formed therebetween, said sleeve member has a bore therein with one end of the bore located at said inside surface of said sleeve member so that the one end of said bore opens to the outside surface of said tubular member and to the joint between said inside surface of said sleeve member and said outside surface of said tubular member, said metering valve is an all metal design with said tubular member and sleeve member each being formed of metal, said sleeve member is of a significantly greater wall thickness than said tubular member, and said bore in said sleeve is arranged to contain a fluid medium so that under pressure said fluid medium in contact with the outside surface of said tubular member flows into the joint between said sleeve member and tubular member and elastically deforms said tubular member without deforming said sleeve member due to the wall thickness differences between said sleeve member and tubular member and effects an inward movement of said tubular member relative to said valve body for at least partially closing the metering valve.

4,520,994

SUB-SURFACE SAFETY GATE VALVE

Jack J. DeWald, 7323 W. Roadway, New Orleans, La. 70124

Division of Ser. No. 61,076, Jul. 25, 1979, Pat. No. 4,392,631.
This application Jul. 7, 1983, Ser. No. 511,459
The portion of the term of this patent subsequent to Jul. 12, 2000, has been disclaimed.
Int. Cl.³ F16K *31/16*
U.S. Cl. 251—58 10 Claims



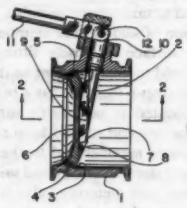
1. A gate valve apparatus, comprising:
a. an elongated generally cylindrical valve body providing a longitudinally running flow conveying bore;
b. a valve gate movable within the confines of the valve body between open flow and closed flow positions and including at least one gear receptive toothed rack;
c. gear structure means rotatably mounted within the valve body for engagedly moving the toothed rack of the valve gate between the open flow and the closed flow positions;
d. operator shaft means carried by and movable within the confines of the elongated valve body for engagedly rotating the gear structure means; and
e. hydraulic attachment means on the valve body for attaching a controlled hydraulic pressure source to the valve body for moving the operator shaft means relative to the valve body.

4,520,995

DISHED DISC FREE-DISC BUTTERFLY VALVE

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Aug. 31, 1982, Ser. No. 413,531
Int. Cl.³ F16K *1/22*
U.S. Cl. 251—162 4 Claims



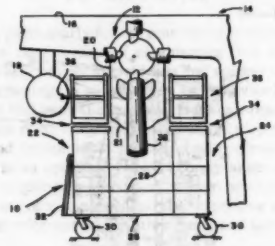
1. A free-disc butterfly valve comprising in combination: a valve body with fluid passage having an inner surface including an annular seat disposed on a plane substantially perpendicular to the central axis of said fluid passage whrein said annular seat substantially coincides with a spherical surface with center substantially coinciding with the central axis of said fluid passage; a stem disposed in an oblique angle with respect to the central axis of said fluid passage, said stem extending through one wall of said valve body rotatably and slidably in a leak-proof manner wherein the center-line of said stem substantially passes through the center of said spherical surface and the inner extremity of said stem includes a retaining slide rail disposed in an oblique angle with respect to the center-line of said stem on a plane substantially including the center-line of said stem; and a dished disc pivotably disposed within said fluid passage adjacent to said annular seat having a rim substantially conforming with said annular seat when said dished disc is rotated to the fully closed position and having a central portion dished away from a plane including said rim toward the center of said spherical surface, said dished disc slidably connected to the inner extremity of said stem by means of said retaining slide rail engaging a retaining slide groove disposed in the convex side of said central portion of said dished disc on a plane substantially parallel to a plane including said rim of said dished disc; whereby, a small amount of axial movement of said stem in one direction relieves the seating pressure between said annular seat and said rim of said dished disc and a small amount of axial movement of said stem in the other direction opposite to said one direction establishes said seating pressure.

4,520,996

AIRCRAFT ENGINE MAINTENANCE STAND

Vincent Viglione, 151 Sun Rise Ter., Springfield, Mass. 01119, and Jack L. Tyndall, 327 Greenaway Dr., Springfield, Mass. 01109

Filed Oct. 2, 1984, Ser. No. 656,843
Int. Cl.³ B66F *5/04*
U.S. Cl. 254—9 C 1 Claim



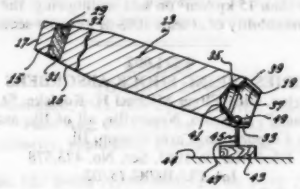
1. An aircraft maintenance stand for use on devices placed on the wings of aircraft comprising:
a rectangular base;
a fixed working platform mounted within said base so that personnel may stand thereon to reach the bottom of said device;
lockable caster wheels, said wheels rotatably affixed to said base at the corners of said base;
a pair of support structures, each of said support structures being rectangular shaped and affixed to said base on opposite sides of said base, said fixed working platform being positioned between said support structures, each of said support structures having four corner posts, at least one diagonal brace connected between two adjacent corner posts, and means for horizontally connecting adjacent posts on said support structure;
means for connecting said support structures together;
a hydraulic lift for each of said support structures, said lift comprising a bottom frame, a top frame, a pair of scissors pivotally attached between said bottom and top frame, a manually operative hydraulic pump means connected to said bottom frame and to said scissors for adjustably moving said scissors, said bottom frame fixedly attached to each of said support strucures;
a working platform, said working platform attached to said top frame of said hydraulic lift; and
a pair of ladders, one of said ladders fixedly attached to each of said support structures.

4,520,997

MODEL CONSTRUCTION TOOL

Allen E. Lorton, Sr., 15906 Mount Jackson St., Fountain Valley, Calif. 92708

Filed Oct. 31, 1983, Ser. No. 546,750
Int. Cl.³ B25C *11/00*
U.S. Cl. 254—26 R 8 Claims



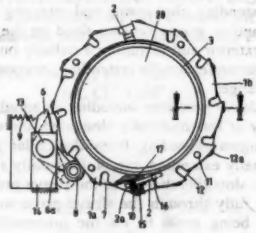
1. A model construction tool for use with pins of the type having a shank and a head and used in model construction, said model construction tool comprising a rigid body having opposite ends, said body terminating in a hammer surface at one of said ends which is adapted for pounding the pins into a surface, said body terminating at the other of said ends thereof in a generally annular, generally axially extending flange, said flange having at least one slot therein opening at said other end of the body, said slot being sized to receive the shank of the pin but being too small to allow the head of the pin to pass through it whereby the slot can be used to pull and remove the pin; said flange at least partially defining a cavity which opens at said other end of said body, said flange being segmented, by said slot; and wherein said flange has inner and outer surfaces and both said inner and outer surfaces taper radially inwardly as they extend axially toward said other end of said body.

4,520,998

SAFETY MECHANISM FOR A HOIST

Heinz Flaig, Bochum, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 413,694, Sep. 1, 1982, abandoned. This application Sep. 4, 1984, Ser. No. 647,026
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, 3137523
Int. Cl.³ B66D *5/04*; F16D *65/10*
U.S. Cl. 254—267 4 Claims



1. A safety mechanism for ensuring that a cable drum-operated hoist does not operate above a predetermined cable speed limit, comprising:

(a) a brake drum directly connected to the cable drum of the hoist and rotating therewith;

(b) a sprocket surrounding said brake drum;

(c) said sprocket being lined with a brake lining interposed between said brake drum and said sprocket;

(d) said sprocket being fixed to and rotatable with said brake drum by the frictional force exerted by said brake lining on said brake drum;

(e) said sprocket being provided at its periphery with at least one stopping slot;

(f) a latching means insertable into said stopping slot and serving to prevent rotation of said sprocket and said brake drum when the predetermined cable speed limit is exceeded;

(g) said sprocket comprised of at least two connected together segments, said segments being connected and selectively variably adjusted together by selective releasing means with respect to one another comprising screws passing from one of said segments into an adjacent of said segments, such that upon selective removal adjustment of said screws said brake lining is adjustably released from said brake drum;

(h) each of said segments being provided for each of said screws with spring support surfaces and the adjacent of said segments having receiving threads for said screws;

(i) said selective releasing means further comprising brake-pressure springs, located between the heads of said screws and said spring support surfaces; and

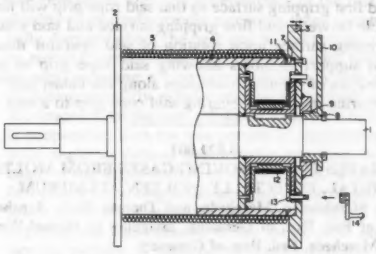
(j) said brake lining being protected on both ends, from contamination, by a pair of sealing rings directly interposed between said brake drum and said sprocket and directly adjacent to said brake lining and completely isolating said brake lining from contamination.

4,520,999

COMBINATION OF A HOISTDRUM AND HOISTCABLE FOR A WINCH

Franciscus M. Philips, Vermeerstraat 30, Alkmaar, and Koenraad A. de Jong, Planetenlaan 56, Opmeer, both of Netherlands

Filed Mar. 1, 1984, Ser. No. 585,046
Claims priority, application Netherlands, Mar. 14, 1983, 8300912
Int. Cl.³ B66D *1/00, 1/26*
U.S. Cl. 254—278 10 Claims



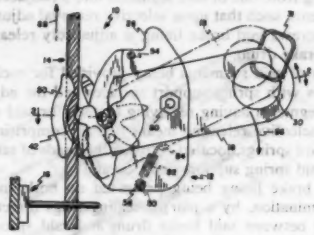
1. In a winch assembly, a hoist drum comprising a pair of spaced side flanges having a cylindrical wall therebetween, a shaft mounting said drum for rotation, an elongated main cable wrapped about the exterior of said cylindrical wall between said side flanges, said main cable having an outer end which is adapted to be displaced relative to the axis of rotation of said drum upon rotation of said drum and an inner end which is releasably attached to said drum at an anchorage location that is fixed in position relative to the axis of rotation of said drum, a spool disposed within said cylindrical wall of said drum in coaxial relation to said drum, an auxiliary cable wrapped about said spool, said auxiliary cable being thinner and more readily breakable upon application of tensile forces thereto than said main cable, said auxiliary cable having an outer end which is attached to said inner end of said main cable, and means for selectively releasing said inner end of said main cable from said anchorage location when said main cable is about to be completely payed out from said drum thereby to free said inner end of said main cable from its attachment to said drum and to permit said main cable to be payed out further and to unwind said auxiliary cable from said spool so as to draw the outer end of said auxiliary cable together with the inner end of said main cable away from said drum.

4,521,000

BYPASSING DOUBLE ACTION ROPE GRIP

Cleveland E. Dodge, Jr., R.D. 1-7, Powaal, Vt. 05261

Continuation-in-part of Ser. No. 501,623, Jun. 6, 1983,. This application May 2, 1984, Ser. No. 606,351
Int. Cl.³ E06C 7/18; A47L 3/04
U.S. Cl. 254—391 10 Claims



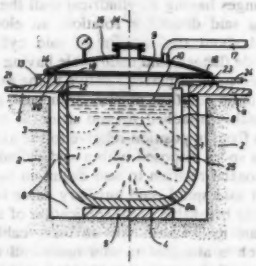
1. A rope grip comprising:
(a) guide means for defining a first gripping surface;
(b) operator means for defining a second gripping surface, said first and said second gripping surfaces defining a passage for receiving a cable therebetween;
(c) support means for rotatably supporting said operator means so that said second gripping surface is in a facing spaced relationship with said first gripping surface, said operator means being configured so that said second gripping surface will define a plurality of radii about its axis of rotation thereby changing the dimensions of said passage upon rotation of said operator means;
(d) a pair of rotatably secured support members with a plurality of spokes having coupling means for supporting said first gripping surface so that said rope grip will jam a cable between said first gripping surface and said second gripping surface upon rotation of said operator means, said support members allowing said rope grip to pass obstacles of specific dimensions along the cable; and
(e) securing means for securing said rope grip to a user.

4,521,001

APPARATUS FOR REMOVING GASES FROM MOLTEN METAL, ESPECIALLY MOLTEN ALUMINUM

Thomas Steinhäuser, Meschede, and Thomas Bilch, Arnsberg, both of Fed. Rep. of Germany, assignors to Honsel-Werke AG, Meschede, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,660
Int. Cl.³ F27B 11/08
U.S. Cl. 266—208 12 Claims



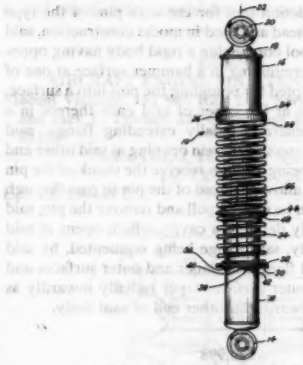
1. An apparatus for removing gases from molten metal, especially from molten aluminum, contained in a ceramic melting receptacle which is accommodated in a furnace; said melting receptacle has a bottom, sides, is open at the top, and has upper rim surfaces on said sides adjacent to said open top; said furnace is provided with a removable cover; a partial vacuum is produced between said cover and the surface of said molten metal; the improvement comprising:
an intermediate ring, which is disposed between said upper rim surface of said receptacle and said cover, and is adapted to support the latter; and
a sealing ring disposed between said intermediate ring and said upper rim surface of said receptacle; said sealing ring is comprised at least partially of fibrous material which can withstand high temperatures; at a surface pressure of greater than 15 kp/cm² on said sealing ring, the latter has a compressibility of at least 10% of its cross-sectional area.

4,521,002

SERIES SPRING SHOCK ABSORBERS

Jon M. Adorjan, Glen Ellyn; Michael H. Kobiske, St. Charles, and Michael P. Astorino, Naperville, all of Ill., assignors to Maremont Corporation, Carol Stream, Ill.

Filed Mar. 9, 1983, Ser. No. 473,578
Int. Cl.³ B60G 15/02
U.S. Cl. 267—8 R 2 Claims



1. A spring-assisted shock absorber assembly comprising:
a shock absorber intermediate cylinder subassembly including an intermediate cylinder, with a cylindrical, intermediate cylinder exterior,
a shock absorber dust tube, the dust tube being slidably mounted to the shock absorber intermediate cylinder subassembly, with the dust tube having a dust tube exterior;
a first, annular, spring retainer fixed on the dust tube exterior and including a radially outwardly projecting, circumferentially extending, first spring end retaining flange;
a second, annular, spring retainer fixed on the intermediate cylinder exterior and including a radially outwardly projecting, circumferentially extending, second spring end retainer flange;
an annular sleeve protector including an annular collar and a plurality of longitudinally elongated, circumferentially spaced fingers extending from the collar and defining longitudinally extending, circumferentially spaced sleeve protection slots therebetween, the sleeve protection slots extending fully through the sleeve protector, the sleeve protector being press fit on the intermediate cylinder exterior between the spring retainers;
an annular spring guide including an annular guide mounting portion and a third radially outwardly projecting, circumferentially extending spring end retaining flange, the spring guide longitudinally slidably mounted on the sleeve protector with the guide mounting portion riding over the sleeve protector slots and the fingers;
a first coil spring having a first spring rate R_1 mounted on the shock absorber assembly and retained between the first spring end retaining flange of the first spring retainer and the third spring end retaining flange of the spring guide; and
a second coil spring having a second spring rate R_2 less than the first spring rate R_1 mounted on the shock absorber assembly and retained between the second spring end

retaining flange of the second spring retainer and the third spring end retaining flange of the spring guide;

the combined spring rate R_C of the first and second springs equaling $(R_1 \times R_2)/(R_1 + R_2)$ and upon full compression of the second spring, because the second spring ceases to act as a spring, the combined spring rate R_C equaling the first spring rate R_1; and

the springs being guided in movement, as the shock absorber assembly expands and contracts, by the spring guide.

4,521,003

TORSION LINK

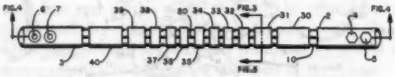
Steven L. Odobasic, P.O. Box 21906, Denver, Colo. 80221

Filed Aug. 27, 1982, Ser. No. 412,095

Claims priority, application United Kingdom, Sep. 15, 1981, 8127751

Int. Cl.³ B60G *11/18*; B64C *27/48*; F16F *1/14*

U.S. Cl. 267—57.1 A **44 Claims**



1. For use in providing a connection between relatively pivotable structural elements spaced from one another on a longitudinal axis, a link comprising: at least one elongate open-section member extending longitudinally of said axis between said elements, said open section member having a transverse web portion at least partially surrounding said longitudinal axis and terminating in elongate free edges movable longitudinally in opposite directions relative to one another when torque is applied to said transverse web portion at longitudinally spaced axial locations, means responsive to relative pivotal motion between said elements at said longitudinally spaced locations for applying a torque to said web portion of said open-section member without substantially constraining said relative movement between said free edges, and means yieldably engaging said open-section member intermediate its ends for stabilizing said web portion transversely under various loads while permitting said relative edge movement when said torque is applied, whereby the connection provided by the link is characterized by axial and transverse strength, high flexural stiffness, and low torsional stiffness.

4,521,004

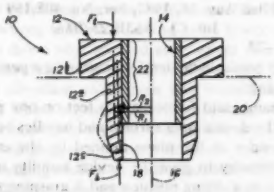
VIBRATION-ISOLATING MOUNTING WITH LOAD-DIRECTING CHAMFER

William F. Caldwell, 3627 S.W. Hamilton Ct., Portland, Oreg. 97221

Filed Oct. 27, 1982, Ser. No. 437,157

Int. Cl.³ F16F *1/36*

U.S. Cl. 267—141.4 **2 Claims**



1. A bushing-sleeve combination for a vibration-isolating mounting, said combination, when in a relaxed state, comprising

a resilient elastomer bushing including an elongated cylindrical body portion having a sidewall, a flange portion integral with said body portion radiating outwardly therefrom adjacent one end of the body portion, a tapered portion joined to said body portion adjacent the other end thereof having an outer surface which decreases in diameter progressing axially away from said body portion, said tapered portion having a length which is greater than the thickness of said sidewall, and a continuous, uniform-diameter bore extending axially the entire length of the bushing, and

an elongated, cylindrical, rigid, hollow sleeve of uniform outside diameter fixably received within said bore, with one end of the sleeve being substantially coplanar with that surface of said flange portion which faces axially away from said body portion, said sleeve having an axial length less than that of said bore.

4,521,005

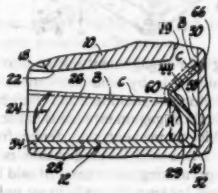
SPRING RETAINER

Sergio L. Calderoni, Dearborn, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 1, 1983, Ser. No. 528,437

Int. Cl.³ F16F *1/12*

U.S. Cl. 267—179 **3 Claims**



1. A spring mount for releasably retaining a substantially cylindrical helical coil spring to a body, said spring being of the type having helically rising coils with the first coil having a lower surface and a helically rising upper surface, comprising,

a base engageable with the lower surface of the first coil,

a plurality of generally axially extending tangs circumferentially disposed about the base and joined thereto so as to be radially movable about their juncture with the base,

each tang including a retention wall with a bias portion extending generally radially relative to the base and axially spaced from the base a distance to define a helix angle in cooperation with the bias portion of another tang, said helix angle so defined substantially matching the helix angle of the upper surface of the first coil, whereby the first coil of the spring when attached to the mount has its lower surface engaging the base and its upper surface engaging the bias portions of the tangs, each said tang moving radially in response to relative rotation of said spring and said base to shift circumferentially the point of engagement of its bias portion with said upper surface,

and a latching member on at least one of the tangs, said latching member axially spaced from the base for movement radially with said tang between a first position retaining the spring to the body at one said point of engagement and a second position releasing the spring from the body at another said point of engagement.

4,521,006

REMOVABLE FENCE FOR TABLE SAW

Deryl P. Waters, 4525 NE. 37th, Portland, Oreg. 97211

Filed Jan. 24, 1983, Ser. No. 460,619

Int. Cl.³ B23Q *3/02*

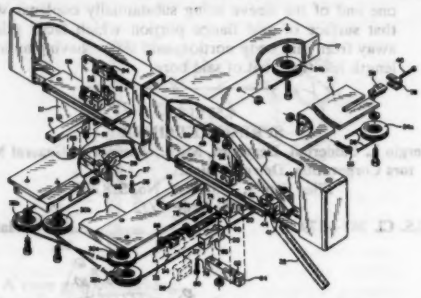
U.S. Cl. 269—304 **13 Claims**

1. In a table saw system having a table and an elongate fence having two ends for maintaining parallelism of objects to be cut relative to a planar saw blade, the combination comprising:

(a) at least two flexible elongate members extending substantially parallel to each other on opposite sides of the table and interconnected for movement in unison in a direction substantially perpendicular to the plane of the sawblade, saw members having respective engagement means affixed thereto at respective points equidistant from the plane of said sawblade for positioning said fence parallel

to said sawblade, said flexible elongate members being movable transversely toward and away from said table, and said engagement means being movable into and out of abutment with said table by movement in unison with said flexible elongate members toward and away from said table; and

(b) locking means mounted on said fence for selectively



moving said engagement means into and out of abutment with said table by said movement in unison with said flexible elongate members and thereby selectively holding each of said engagement means in frictional abutment with said table to prevent said fence from moving relative thereto when said locking means is in a locked position and for permitting movement of said fence along said table when said locking means is in an unlocked position.

4,521,007

BRAKING BRUSHES IN FOLDING APPARATUS OF ROTARY PRINTING MACHINES

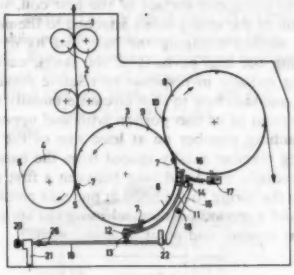
Walter Darda, Eppelheim, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jun. 15, 1984, Ser. No. 620,859

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321577

Int. Cl.³ B42C *1/04*; B65H *23/08*

U.S. Cl. 270—47 **5 Claims**



1. Braking-brush assembly in folding apparatus of a rotary printing machine having braking brushes for stretching web sections which are being conveyed in a given direction on a folding cylinder of the folding apparatus, the braking brushes individually being disposed so as to match the curvature of the cylinder and being distributed over the length of the cylinder, comprising a spindle and a cross bar both spaced from one another and extending transversely to the given direction in which the web sections are being conveyed, the braking brushes being articulatingly fastened at lower ends thereof to said spindle and at upper ends thereof to said cross bar, and respective levers supporting said cross bar at each end thereof, said cross bar being independently adjustable by the respective levers for pressing the braking brushes to a greater and lesser extent selectively against the web sections being conveyed on the cylinder.

4,521,008

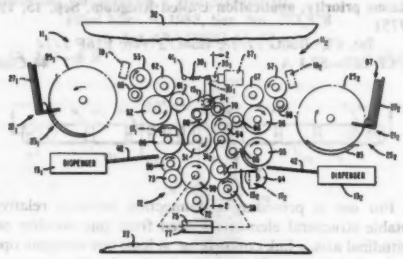
FAIL SAFE DOCUMENT DISPENSING SYSTEM

Robert H. Granzow, Miamisburg; Desh B. Gupta, Dayton; Kimbrough I. Myers, Kettering, and Mark D. Filliman, Beavercreek, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 3, 1983, Ser. No. 471,921

Int. Cl.³ B65H *5/22*

U.S. Cl. 271—3 **19 Claims**



1. An article dispensing system comprising:

first and second article dispensing subsystems, each of said article dispensing subsystems comprising:

dispensing means responsive to a first signal for either sequentially dispensing articles therefrom or for generating a second signal when no articles are being dispensed therefrom;

an output receptacle;

conveying means for feeding articles from said dispensing means to said output receptacle; and

diverter means being responsive to a third signal for diverting articles from said associated dispensing means to said output receptacle of the other one of said article dispensing subsystems; and

means being responsive to said second signal from one of said subsystems for selectively generating first and third signals to cause articles to be fed to said output receptacle in said one of said subsystems from said dispensing means in the other one of said subsystems.

4,521,009

PORTABLE EXERCISE DEVICE

Gary G. Pomeroy, 117 Glenside Tr., Sparta, N.J. 07871

Filed Aug. 16, 1982, Ser. No. 408,168

Int. Cl.³ A63B *23/04*

U.S. Cl. 272—73 **9 Claims**

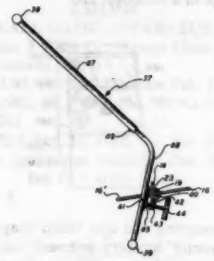
1. An easily portable device for exercising a person's legs or arms comprising

a curved frame, said frame having feet on one end for supporting the device on a surface and handles being located on both sides of the plane defined by the curve of the frame, whereby to give the device stability in use when the user is in a sitting position and is grasping the handles, the mid-section of said frame is curved rearwardly in cantilevered fashion from the principal plane defined perpendicular to the handles and feet;

a pedal assembly, said pedal assembly comprising an axle mounted on said frame having a pair of diametrically opposed crank bars affixed on opposite ends of said axle, said crank bars providing pedals for causing said axle to revolve;

means providing resistance to the rotation of said axle including

a resilient single piece clamp sleeve fitting around the axle



with one end of the sleeve being fixed relative to said frame and the other movable end being resiliently and adjustably pressed toward said fixed end by action of a screw rotating in a threaded nut fixed to the frame.

4,521,010

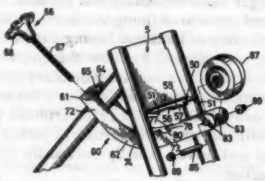
EXERCISER TENSION DEVICE ASSEMBLY

Daniel G. Hahn, 1040 E. North Ave., Olney, Ill. 62450

Filed Aug. 15, 1983, Ser. No. 523,278

Int. Cl.³ A63B *69/16*

U.S. Cl. 272—73 **10 Claims**



1. In a bicycle type exerciser in which a wheel on which a tire is mounted is supported for rotation off the ground between two spaced legs of a fork, the improvement comprising a head plate extending between and secured to said fork legs above said wheel, said plate having at its lower edge an outturned lip; a down tube secured at its upper end to said head plate and extending from a position above said wheel downwardly in a direction away from said wheel, and means for braking said wheel adjustably through a range of resistance, said means comprising a yoke, U-shaped in plan, having two arms and a bridging section between them at one end of said arms, said bridging section extending across said down tube on a side of said down tube away from said wheel and said arms having at their free ends means for mounting a braking element between them to engage said wheel, each of said arms having a knuckle member engaging said lip to form a hinge connection between said plate and said yoke, and means extending between said down tube and said bridging section for selectively rocking said yoke about said hinge connection to move said braking element into tighter or looser engagement with said wheel.

4,521,011

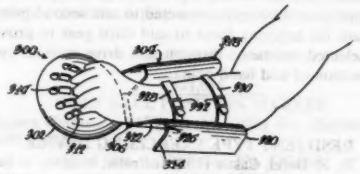
HAND ENGAGEABLE AQUATIC EXERCISE ASSEMBLY

Daniel S. Solloway, 1315 18th St., Woodward, Okla. 73801

Continuation-in-part of Ser. No. 314,690, Oct. 26, 1981, Pat. No. 4,411,422, which is a continuation-in-part of Ser. No. 79,966, Sep. 28, 1979, Pat. No. 4,311,306. This application Sep. 30, 1982, Ser. No. 429,270

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—116 **15 Claims**



14. A hydrodynamic stroke builder for use in water to strengthen the user's arm muscles, comprising:

a hand section having manually grippable portion and a water impingement surface; and

a substantially rigid forearm section operatively associated and cooperating with said hand section for engaging and deflecting water and exerting hydrodynamic resistive forces on the user when said hydrodynamic stroke builder is moved in the water, said substantially rigid forearm section having a generally imperforate forearm-engaging portion and at least one substantially stationary, generally rigid, U-shaped fin fixedly secured to said forearm-engaging portion.

4,521,012

VARIABLE RESISTANCE EXERCISE APPARATUS AND IMPROVED METHOD OF EXERCISING

Theodore E. Cosby, Newport Beach, Calif., and Patrick J. Cunningham, 600 Ladera Vista Way, Fullerton, Calif. 92631, assignors to Patrick J. Cunningham, Fullerton, Calif.

Filed Jan. 31, 1983, Ser. No. 462,555

Int. Cl.³ A63B *21/22*

U.S. Cl. 272—73 **11 Claims**

1. An improved exercise apparatus comprising:

a platform adapted to be positioned upon a support surface;

a column extending from said platform in a generally vertical orientation, said column comprising a pair of struts extending from said platform;

a shaft mounted between said struts;

a yoke having a first end pivotally connected to said shaft and a second end extending away from said shaft;

a hand crank mounted to said second end of said yoke such that pivoting said yoke upon said shaft provides means for adjusting the distance between said hand crank and said platform to cause a full extension of one of the upper extremities of a user standing on said platform and grasping said hand crank, thereby causing the user's body to rotate about the hips and waist, causing the user's torso to

stretch and twist during cycling motion of said hand crank to exercise the muscles of the user's waist, abdomen, chest, back, and shoulders;

means for retaining said hand crank at a selected distance from said platform; and

a drive train connected to said hand crank, said drive train including:

a first gear and a second gear mounted to said shaft;

drive means for transmitting force between said hand crank and said first gear;

a third gear drivingly connected to said second gear; and

means for applying force to said third gear to provide a selected resistance through said drive train to cycling motion of said hand crank.

4,521,013

RESILIENT TYPE EXERCISING DEVICE

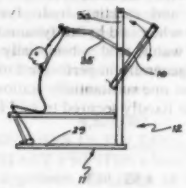
Andrew W. R. Dofel, Castle Hill, Australia, assignor to Supafit Gymnasium Equipment Pty. Ltd., Castle Hill, Australia

Filed Mar. 17, 1983, Ser. No. 476,355

Claims priority, application Australia, Apr. 8, 1982, PF3538; Oct. 7, 1982, PF6240; Nov. 9, 1982, PF6716

Int. Cl.³ A63B *21/04*

U.S. Cl. 272—136 **15 Claims**



7. An exercise device having a generally rigid frame with a ground engaging base and a post extending generally upwardly from the base, a resistance assembly comprising a hollow elongated casing, a carriage mounted within the casing and movable longitudinally therewithin, a resilient member attached to said carriage and said casing for developing a tensional force that resists the longitudinal movement of said carriage in a predetermined direction, and a pulley system mounted within the casing for longitudinally moving said carriage, said pulley system including a cable which extends outwardly of the casing and is looped about the carriage and which, in response to being pulled, causes the carriage to move longitudinally in said predetermined direction against said tensional force developed by said resilient member, and wherein mounting means are provided for mounting said resistance assembly in several alternative positions on said base or post to enable a user to perform a variety of exercises by pulling on said cable to thus tension said resilient member.

4,521,014

VIDEO GAME INCLUDING USER VISUAL IMAGE

David H. Sitrick, 820 Burchell Ave., Highland Park, Ill. 60035

Filed Sep. 30, 1982, Ser. No. 431,153

Int. Cl.³ A63F *9/22*

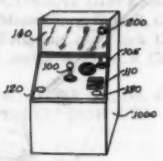
U.S. Cl. 273—1 GC **12 Claims**

1. A video game system comprising:

user input apparatus for providing signal outputs responsive to user provided stimulus;

control means for providing a video game audiovisual presentation, said presentation comprising a sequence of display images, said display images each comprising the combination of a plurality of predetermined imagery segments including a preselected character imagery segment, said sequence order of presentation determined responsive to a non-user defined predefined set of game rules and responsive to the user input apparatus;

means for creating a user video image responsive to the user input apparatus including means for storing said user video image in a memory; and



means for associating said user video image with said preselected character imagery segment such that said user video image is incorporated into said audiovisual presentation of said video game.

4,521,015

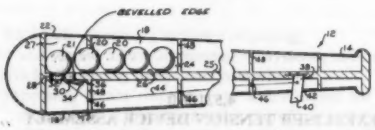
TOY BASEBALL BAT DEVICE

Joseph A. Carafeno, 15 Miller Rd., Northford, Conn. 06472

Filed Dec. 19, 1983, Ser. No. 563,134

Int. Cl.³ A63B *69/40*

U.S. Cl. 273—26 B **12 Claims**



1. A toy baseball bat device comprising:

an elongated member having an exterior configuration in the form of a baseball bat of cylindrical cross section having a smaller diameter handle end portion and an oppositely disposed larger diameter hitting end portion,

said hitting end portion forming an interior chamber for housing a plurality of balls and having a radially disposed ejection aperture adapted to allow the ejection of a ball radially outwardly from said interior chamber,

a ball support means within said interior chamber for supporting an individual ball at a predetermined position in alignment with said ejection aperture to permit the ball to be impacted and driven radially outwardly through said ejection aperture,

means for guiding the balls within said chamber to said ball support means,

a striker element pivotally mounted within said chamber for pivotal movement between first and second positions so as to strike a ball mounted on said support means at said predetermined position as said striker element pivots towards said first position to drive the ball radially outwardly through said ejection aperture, said second position being spaced from a ball supported on said support means,

a torsion spring means for propelling said striker element towards said first position to strike a ball mounted on said support means, said torsion spring means being connected to said striker element and normally biasing said striker element towards said first position, and

trigger means operationally connected to said striker element for momentarily withdrawing said striker element towards said second position into spaced disposition from a ball supported on said support means against the biasing force of said torsion spring means and adapted for abrupt release of said striker element whereby the biasing force of the torsion spring means pivots said striker element toward said first position to impact a ball supported by

said support means at said predetermined position and drive said ball radially outwardly through said ejection aperture.

4,521,016

BALL GAME APPARATUS

Yasuhiro Tominaga, 3 Wills Ct., Wyuna Close, Mt. Ommaney, Queensland, Australia (4074)

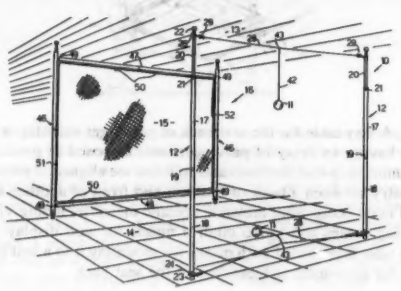
PCT No. PCT/AU81/00079, § 371 Date Feb. 23, 1982, § 102(e) Date Feb. 23, 1982, PCT Pub. No. WO82/00008, PCT Pub. Date Jan. 7, 1982

PCT Filed Jun. 26, 1981, Ser. No. 355,575

Claims priority, application Australia, Jun. 26, 1980, PE4224

Int. Cl.³ A63B *61/00*

U.S. Cl. 273—29 A **12 Claims**



12. Apparatus for practicing a ball game or sports, comprising in combination:

ball means;

elastic cord means connected at one end to said ball means, said cord means being elastically stretched subsequent to striking of said ball means causing return of said ball means;

slack net means having a front side and a rear side, said ball means disposed in front of said slack net means and in the path of movement thereof, for dissipating substantially all of the stored energy in the ball means and thus reducing the rate of return of the ball means;

supporting means placed in front of said slack net means, said supporting means being separated from the slack net means by a predetermined distance;

means for anchoring the other end of the elastic cord means; and

sheave means arranged on said supporting means for connecting said ball means to said supporting means by said cord means extending through said sheave means.

4,521,017

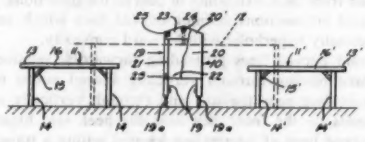
TABLE TENNIS GAME AND TRAINING APPARATUS

James B. McCready, 6 Tods Driftway, Old Greenwich, Conn. 06870

Filed Feb. 23, 1984, Ser. No. 582,958

Int. Cl.³ A63B *67/04*

U.S. Cl. 273—30 **13 Claims**



1. A tennis game and training apparatus comprising a net structure having a width, depth and height in combination with a pair of identical tables, each of said tables having a width somewhat shorter than the width of said net structure, a depth which is approximately two thirds its width and a height of about 18 to 22-inches, each table being transversely divided into three equal size playing areas, the central playing area being added respectively to the right and left playing areas for designating the right and left service courts, and the tables being parallel to, and equally spaced from the net structure by a distance such that, for a player standing near the remote edge of one table, the remote edge of the opposing table subtends an angle corresponding to the angle subtended by one base line of a regulation court to a player standing on the opposing base line.

4,521,018

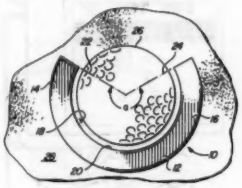
GOLF BALL POSITION MARKER

N. Eugene Cotchonis, 14750 Round Valley Dr., Sherman Oaks, Calif. 91403

Filed Oct. 3, 1983, Ser. No. 538,666

Int. Cl.³ A63B *57/00*

U.S. Cl. 273—32 A **1 Claim**



1. A marker for marking the position of a golf ball that is to be lifted from a putting green surface, said marker comprising a thin gage planar body including a first inner boundary defining a segment of a circle and a second outer boundary generally surrounding said first boundary, said segment defining an angle of greater than 180 degrees and less than 360 degrees, the size of said circle being such that said planar body may be moved vertically downwardly so as to pass closely over the golf ball to be marked onto the putting surface green to mark the position of the golf ball thereon, the thinness of said planar body being such that said planar body presents minimal obstruction to a putted golf ball rolling thereover.

4,521,019

KICKER WHEEL WITH REPLACEABLE SURFACE FOR BOWLING APPARATUS

Joseph F. Prawdzik, Irving, Tex., assignor to Tiger Products, Inc., Irving, Tex.

Filed Jul. 22, 1982, Ser. No. 400,791

Int. Cl.³ A63D *5/02*

U.S. Cl. 273—49 **9 Claims**

9. A hub member for a kicker wheel assembly for a bowling ball return mechanism, said hub member comprising:

an upper portion having a shaft depending thereform,

a center bore through the longitudinal axis of said upper

portion and said depending shaft adapted to receive a shaft of said ball return mechanism;

a driving portion affixed on said depending shaft and having a non-circular outer periphery thereon, said driving portion being formed of polyurethane.

4,521,020

APPARATUS FOR DISPLAYING GROUPED CHARACTERS IN SCANNING TYPE DISPLAY

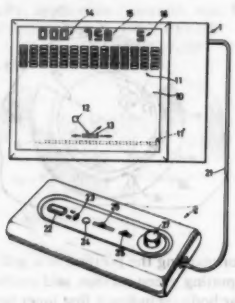
Masayuki Uemura, Kyoto; Akitsugu Murauchi, Osaka, and Takehiro Izushi, Kyoto, all of Japan, assignors to Nintendo Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 84,136, Oct. 12, 1979, abandoned. This application Dec. 9, 1982, Ser. No. 448,412

Claims priority, application Japan, Dec. 5, 1978, 53-150782; Dec. 16, 1978, 53-155538; Apr. 24, 1979, 54-51114

Int. Cl.³ A63F 9/22

U.S. Cl. 273—85 G 66 Claims



1. An apparatus for displaying a group of characters (11) at predetermined positions on a screen of a display by repetitive horizontal and vertical scanning, said screen of said display comprising a relatively large number of dots in the horizontal and vertical directions, respectively, wherein each of said characters (11) includes an arrangement of dots arranged in a plurality of rows in the vertical direction and in a plurality of columns in the horizontal direction on the screen of said display, comprising: first storage means (RAM 31) having storing positions corresponding in number to the number of said characters (11) to be displayed for loading an information signal of one logic state in those storage positions corresponding to characters (11) to be displayed and for loading an information signal of the other logic state in those storage positions corresponding to characters (11) not to be displayed, horizontal direction addressing ring counter means for providing the same row addressing signal continuously and in the form of counting pulses corresponding to the horizontal width of each character (11) on the screen of said display at said predetermined positions, vertical direction addressing ring counter means for providing the same column addressing signal continuously and in the form of further counting pulses corresponding to the vertical width of each character (11) on the screen of said display at said predetermined positions, first reading means for reading said information from said storing positions of said first storage means (RAM 31) as addressed, and converting means responsive to said information indicating whether or not the character read by said first reading means is to be displayed, said converting means converting said information into an electrical signal for displaying said characters (11) at the predetermined positions on the screen of said display corresponding to said information indicating whether or not the character is to be displayed.

4,521,021

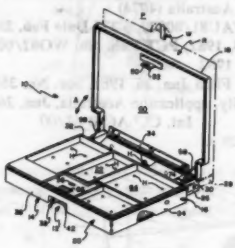
VIDEO GAME TABLE FOR AIRLINES COMMERCIAL VEHICLES OR THE LIKE

Claude E. Dixon, 104 Spree Ave., Grass Valley, Calif. 95945

Filed Feb. 1, 1983, Ser. No. 463,005

Int. Cl.³ A63F 9/22

U.S. Cl. 273—148 B 11 Claims



1. A tray table for the seat back of passenger vehicles or the like having an array of passenger seats disposed in rows and columns such that the rows and columns are aligned to provide registry between a back of one seat and front of another seat, said table comprising movable console means including video display means and video control means for said display and said table is provided with means for mounting it to a seat back and for movement independent of the seat back.

4,521,022

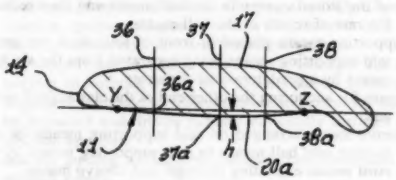
GOLF IRON FACE

Glenn H. Schmidt, 1857 Los Encinos, Glendale, Calif. 91208

Filed May 17, 1983, Ser. No. 495,520

Int. Cl.³ A63B 53/04

U.S. Cl. 273—175 7 Claims



1. In a golf iron head having a heel, toe, bottom surface, a rear side and a front face to strike a ball, said front face angled from vertical in ball addressing position, the improvement comprising

(a) said front face having bulge curvature defined by the intersections with said face of planes generally normal to said front face, extending in heel to toe directions,

(b) said intersections defining curved lines which are substantially hyperbolic with forward convexity,

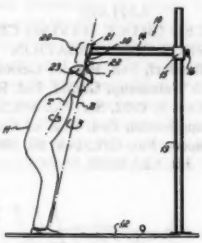
(c) said curved lines protruding forwardly, relative to a plane passing through vertically spaced points on the front face near the toe, and through vertically spaced points on the front face near the heel, said hyperbolic curved lines of intersection located within a trapezoidal area defined by said front face, the corners of said trapezoidal area defined by said points, the maximum forward protusion of said hyperbolic curved lines relative to said plane being less than $\frac{1}{4}$ inch.

4,521,023

GOLF TRAINING DEVICE

Frank M. Williams, 121 W. Southington, Riverlee, Worthington, Ohio 43085

Filed Nov. 25, 1983, Ser. No. 554,889
Int. Cl.³ A63B 69/36
U.S. Cl. 273—183 B 8 Claims



1. A golf training device to teach body movement during a golf swing which substantially maintains fixed the intersection of the user's torso axis and the user's body axis, said torso axis being defined as a line extending generally through the top of the user's head and a point midway between the user's hips, said body axis being defined as a line extending generally through a point midway between the outer surfaces of the user's eyes to a point midway between the balls of the user's feet, said axes intersecting at a point about at the top of the user's head, said device comprising:

a rigid arm adapted to be fixedly located in a generally horizontal orientation, and

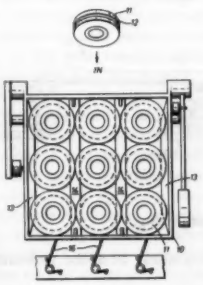
head control means carried by the arm, said head control means comprising a cap for the user's head, first means for restricting head movement to free rotation about said body axis, and including resilient means for limited head movement along said body axis, and second means for restricting head movement to free rotation about said torso axis, said second means being fixed with respect to the first means, said head control means being operative to maintain substantially fixed the point of intersection of said torso and body axes during the user's golf swing.

4,521,024

APPARATUS FOR PLAYING A GAME

Brian P. Slade, Ashford, England, assignor to Seven Towns Limited, London, England

Filed Jan. 27, 1984, Ser. No. 574,418
Claims priority, application United Kingdom, Dec. 1, 1983, 8331790
Int. Cl.³ A63F 3/00
U.S. Cl. 273—271 7 Claims



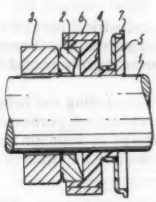
1. Apparatus for playing a game, comprising a set of playing pieces having at least three distinct identifiable subsets and a playing surface arranged to receive the pieces and maintain them in a row and column matrix with pieces touching adjacent pieces defining the columns of said matrix and with said matrix being filled with less than the set of said pieces, guide means fixed in relation to said playing surface guiding the pieces for movement along the columns between their ends and permitting pieces to enter and leave each column from its ends so that insertion of a piece at one end of the column causes the pieces to be displaced along the column with a piece being discharged from the other end of the column, and means defining a unique direction in which pieces move along each column.

4,521,025

SEAL DEVICE

Per-Erik Leonardsson, Rönninge, Sweden, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 3, 1984, Ser. No. 606,440
Claims priority, application Sweden, May 13, 1983, 8302726
Int. Cl.³ F16J 15/36
U.S. Cl. 277—89 4 Claims



1. A sealing device for a shaft comprising:

a first sealing ring having an end face and which is positioned around the shaft in non-rotatable engagement therewith;

a second sealing ring disposed adjacent said end face and being mounted for rotation with the shaft;

a resilient protection member which is secured to the shaft and is positioned on a portion of said second sealing ring to prevent accumulation of pollutants around said second sealing ring;

first gripping means clamped onto said resilient protection member for applying at least radial forces to said protection member which cause the latter to axially expand and urge said second sealing ring into contact with said end face of said first sealing ring; and

second gripping means attached to the shaft and contacting said first gripping means for preventing radial movement of said protection member.

4,521,026

SHAFT SEAL

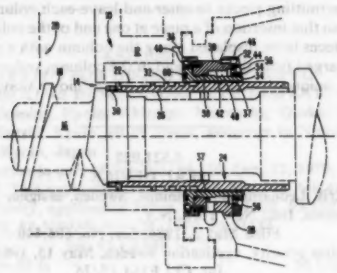
Daniel L. Eide, Carmel, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 21, 1983, Ser. No. 534,386
Int. Cl.³ F16J 15/34
U.S. Cl. 277—134 6 Claims

1. In an apparatus which includes a housing having a passage extending from the exterior of the housing to an inlet opening within the interior of the housing through which dry particulate thermoplastic material enters the interior of said housing, a shaft rotatably supported in said housing and extending through said passage, and a seal between said shaft and a surface of said passage for limiting flow of the particulate material through said passage along said shaft, the improvement comprising

the seal including a sleeve surrounding and secured to the shaft to rotate therewith, said sleeve extending along said surface of the passage, and having in its outer surface a variable pitch thread with the threads being directed

toward the inlet opening within the housing so as to direct most of the particulate material entering the threads in a direction back into the housing upon rotation of the shaft but allowing a small amount of material to flow along the passage in a direction opposite to the interior of the housing;



the sleeve having a cylindrical portion extending along the surface of the passage from the threads to the exterior of the housing and being slightly spaced from said surface of the passage; and

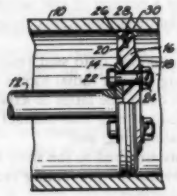
heat control means surrounding and being remote from said space between the cylindrical portion of the sleeve and the surface of the passage to maintain the small amount of material which flows into the space in a molten condition.

4,521,027

DOUBLE FLANGE SEALING MEMBER FOR SINGLE ACTION PISTON PUMP

Charles R. Marshall, Warwick, R.I., assignor to Dixon Industries Corporation, Bristol, R.I.

Filed May 17, 1984, Ser. No. 611,211
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—152 **18 Claims**



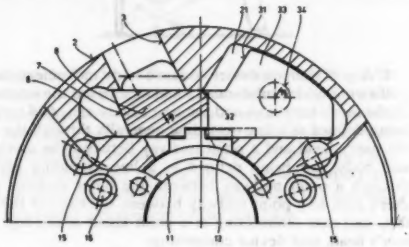
1. A one-piece, self-lubricating, thermoplastic sealing member suitable for mounting on a piston located within a piston and cylinder assembly that operates under differential pressure, said piston and cylinder capable of moving axially relative to one another, said sealing member comprised of an annular shaped body, a peripheral wall portion of which is radially cut into two flexible and resilient flanges of preselected length and thickness, said flanges being substantially in registry with one another, in radial alignment with a transverse axis of said sealing member in an initial position and can be bent in the vicinity of their respective bases in the same direction from said initial position to a preselected angle below about 20° relative to said transverse axis of said sealing member, said flanges having a memory which urges them to return to their initial prebent position, said sealing member adapted for disposition in an annular space between said piston and said cylinder so that: (1) the peripheral positions of said flanges are placed in continuous contact under tension with the annular surface of the inner walls of said cylinder, providing two discrete sealing engagements therebetween in seriatim, the memory of said flanges causing their peripheral portions to be urged radially against the annular surface of the inner walls of said cylinder so as to continuously compensate for any irregularities of the annular surface of the inner walls of said cylinder and maintain said sealing engagements during axial movement of the piston with respect to the cylinder, and (2) the peripheral portion of said sealing member which is oppositely disposed to said flanges is fixedly secured in said piston.

4,521,028

POWER OPERATED CHUCK HAVING CENTRIFUGAL FORCE COMPENSATION

Karl Hiestand, Pfullendorf, Fed. Rep. of Germany, assignor to SMW Schneider & Weisshaupt GmbH, Fed. Rep. of Germany

Filed Dec. 9, 1982, Ser. No. 448,238
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148661; European Pat. Off., Feb. 10, 1982, 82109110.5
Int. Cl.³ B23B *31/14*
U.S. Cl. 279—1 C **25 Claims**



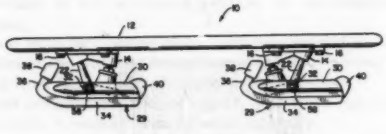
1. A power operated chuck for lathes, comprising a chuck body having a central bore with at least one groove extending radially of the bore, a jaw movable in the groove having a rear face with serrations, a receiving pocket defined in said body adjacent to the groove, a key bar movable in said pocket having a serrated edge engaged with the serrated edge of said jaw to shift said jaw inwardly and outwardly in the associated groove, a shifting element having a surface engageable with said key bar shifting said bar, said chuck having a free space alongside said receiving pocket and a centrifugal weight associated with and movable with said key bar and subject to centrifugal force during rotation of said chuck to act on said bar and said jaw to direct the radial force against said jaw in an amount to compensate for centrifugal force produced by the rotation of the chuck.

4,521,029

ICEBOARD

Thomas L. Mayes, 3913 South Rd., Chesapeake, Va. 23321

Filed Jun. 22, 1982, Ser. No. 390,971
Int. Cl.³ A63C *17/18*
U.S. Cl. 280—7.14 **9 Claims**



1. An iceboard comprising:

a platform,

a pair of trucks depending from the underside of the platform,

an axle extending laterally from each side of each truck,

a pair of skates, each having an ice-engaging pivotal movement about the axles, and

means for mounting said skates for unrestrained pivotal movement about the axles, said mounting means including for each of said skates, a transverse tube defined in a skate housing for receiving a bushing therein; a bushing having an axial length substantially equal to the axial length of said transverse tube and sized at its interior for receiving an axle therethrough, and means for pivotally securing said skate to said axle for free pivotal movement about said axle while preventing the skate from moving laterally along the axial length of said axle;

wherein one of the trucks depends from a forward portion of the platform, and each of the skates associated with the forward truck has a protrusion which extends upwardly to a height such that the upper terminus of said protrusion engages the forward portion of said underside of the platform as the skates pivot around the axle and prevent the forward portion of the platform from engaging the ice.

4,521,030

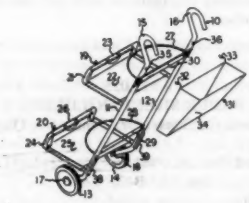
COLLAPSIBLE AND SLIDABLE CART

Jeffrey D. Vance, 7703 24th Ave., N., Hugo, Minn. 55038

Filed Aug. 9, 1982, Ser. No. 406,291

Int. Cl.³ B62B *1/04*

U.S. Cl. 280—42 **20 Claims**



1. A collapsible cart for transporting articles having at least two wheels, at least one article supporting surface and being collapsible for storage, said cart comprising:

a. two generally spacially parallel support members, each having a handle portion for gripping at its upper end and a wheel mounted for rotation at its lower end, said two parallel support members being of a light-weight, tubular construction and each having a tubular post member with an indented ring portion intermediate its length extending generally perpendicularly therefrom,

b. at least one tray member for supporting articles, said tray member extending forward and outwardly from said spacially parallel support members and being attached for rotation to the post member extending from each said support member, said tray member further comprising an elongated tubular perimeter member having an indented circular wall structure at its opposite ends for receiving and for the mating rotational movement with the indented ring portions of said post members, and,

c. means to lock said two parallel support members in a fixed and predetermined spacially parallel configuration by controlling the rotational movement of said perimeter member of said tray member relative to said support members, whereby, a user by operating said lock means can place said cart in either a configuration of use by fixing said tray member generally in a horizontal position or in a configuration for storage by rotationally collapsing the tray member of said cart.

4,521,031

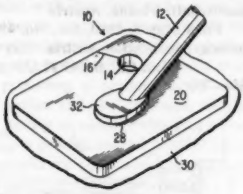
TWO-WHEELED VEHICLE KICKSTAND SUPPORT PAD

Robert M. Huth, 3480 Mirror La., Cincinnati, Ohio 45211

Filed Mar. 7, 1983, Ser. No. 472,584

Int. Cl.³ B62H *1/02*

U.S. Cl. 280—293 **8 Claims**



1. A device for maintaining two-wheeled vehicles having a kickstand in the upright position on soft supporting surfaces, said device comprising:

a thin resilient, planar member, having at least two sides, each side of said member being equally capable of supporting said vehicles;

means for reinforcing said planar member for preventing said kickstand from sinking into said soft supporting surface.

4,521,032

BRAKE DEVICE FOR SKIS

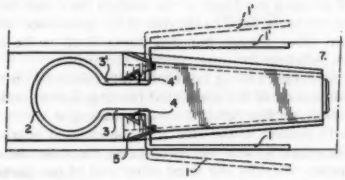
Gaston Haldemann, Fürigen, and Francois Wirz, Savièse, both of Switzerland, assignors to Haldemann A.G., Stans, Switzerland

Filed Jan. 18, 1983, Ser. No. 458,910

Claims priority, application Switzerland, Jan. 27, 1982, 495/82

Int. Cl.³ A63C *7/10*

U.S. Cl. 280—605 **10 Claims**



1. Device for braking skis, characterized by the fact that it comprises two lateral arms resiliently interconnected to each other in a manner to maintain them spaced apart, each arm, under the influence of this resilient action, bearing against an incline forming an angle with the upper surface of the ski and which has an element secured to the ski, and by the fact that a forward portion interconnecting the two lateral arms serves as a lever and is adapted to be actuated by a ski boot to control the movement of these arms between an active position, in which they project beneath the sole of the ski and are outwardly directed from the latter, and an inactive position, in which they are retracted substantially parallel to and above the upper edges of the ski, and a casing containing at least one portion of the binding device of the boot on the ski, said lateral arms being introduced with play each through a cylindrical axle pivotable on itself and transversely slidable in the lateral walls of the casing, each transverse cylindrical axle being provided with a finger coacting with inclines on the casing.

4,521,033

ASSEMBLY COMPRISING A FRAME, UNSTEERED WHEELS AND SPRING SUSPENSION OF A MOTOR VEHICLE

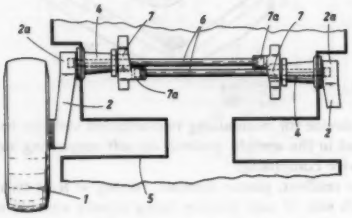
Hugo Lenhard-Backhaus, Vienna, and Kurt Krumpeck, Schützen, both of Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed May 4, 1983, Ser. No. 491,383

Claims priority, application Austria, May 11, 1982, 1835/82

Int. Cl.³ B60G *11/20*

U.S. Cl. 280—700 **3 Claims**



1. An assembly comprising a frame for a motor vehicle adapted to be driven in a direction of travel, a pair of unsteered wheels disposed on opposite sides of said frame, and a spring suspension comprising a respective longitudinal control arm connected to each one of the wheels for constraining the wheel, each control arm having a hub, a respective bearing sleeve having one end secured to the frame and associated with a respective one of the control arms, the control arm hub being rotatably mounted in the associated bearing sleeve, the bearing sleeves having inner ends facing each other, a respective torsion bar associated with each wheel control arm for urging said control arm to a predetermined angular position about the axis of the associated bearing sleeve and having two ends, the torsion bars having axes extending parallel to each other transversely to the direction of travel and the torsion bars being arranged one behind the other in said direction, and a respective anchor secured to said frame against rotation about the axis of an associated one of the torsion bars, one end of each torsion bar being fixed to the hub of the associated control arm and the other torsion bar end being fixed to be associated anchor, wherein the improvement comprises

(a) the anchors being concentrically mounted on the facing inner ends of the associated bearing sleeves and

(b) each anchor being a casting having a sprue eccentric with respect to the axis of the associated bearing sleeve, the other torsion bar ends being fixed in the eccentric sprues whereby the fixed other end of one torsion bar is offset from the fixed one end of the other torsion bar.

4,521,034

LOCKABLE MOVING BELT ANCHOR FOR PASSIVE VEHICLE OCCUPANT RESTRAINT BELT SYSTEMS

Juichiro Takada, Tokyo, Japan, assignor to Takata Corporation, Tokyo, Japan

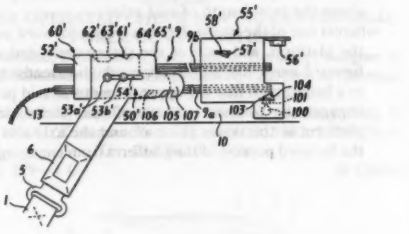
Division of Ser. No. 44,196, May 31, 1979,. This application Mar. 17, 1982, Ser. No. 359,116

Claims priority, application Japan, Jun. 8, 1978, 53-077236; Jun. 8, 1978, 53-068348; Jun. 9, 1978, 53-068758; Jun. 15, 1978, 53-081113; Jun. 29, 1978, 53-078097; Feb. 21, 1979, 54-018500; Feb. 28, 1979, 54-021883; Feb. 28, 1979, 54-024068; Mar. 8, 1979, 54-030229; Mar. 26, 1979, 54-034247

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **12 Claims**

1. In a passive vehicle occupant restraint belt system having a restraint belt which can be shifted between an occupant-restraining configuration and an occupant-releasing configuration by movement of a portion thereof along a path defined by a guide rail affixed in the vehicle, the improvement comprising a movable anchor member received for movement along the rail and adapted to receive said belt portion, an anchor transfer element coupled to the movable anchor member to move it along the rail, a fixed anchor member at a restraint location along the guide rail corresponding to the occupant-restraining configuration of the belt, and locking means for selectively locking the movable anchor member to the fixed anchor member so that the belt is anchored in the occupant-restraining configuration and for releasing the movable anchor member



from the fixed anchor member so that it can be moved along the guide rail by the transfer element to transfer the belt to the occupant-restraining configuration, wherein the locking means comprises a shoulder on one of the anchor members and an inertia device on the other anchor member which includes an inertial mass adapted to detect a rapid change in velocity and move in response thereto and a locking member movable by the mass into locking engagement with the shoulder on said one anchor member.

4,521,035

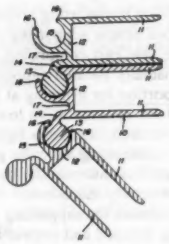
PAPER SHEET HOLDERS

John W. Berezowsky, 2 Sunset Dr., Senneville, Quebec, Canada H9X 1S5

Filed Oct. 20, 1981, Ser. No. 313,237

Int. Cl.³ B42F *9/00*

U.S. Cl. 281—48 **12 Claims**



1. a device for holding paper sheets such as magazines, catalogues and the like comprising:

at least one U-shaped sheet holder integrally formed of resilient material having two arms extending frontally of a base, the arms being adapted to grip the paper sheets,

a rod member extending from one side of said base of the holder and rearwardly of said arms, said rod member being integrally formed with said base and connected to said base by a substantially rigid short neck,

a groove behind and at the other side of the holder, said groove being formed in said base and provided with an opening which is substantially larger than the width of said neck,

the rod member in the holder being adapted to mate with the groove in a substantially similar adjacent device on the

one side of the holder and to pivot therein so as to form a tongue and groove pivot means, and

the groove in the holder being adapted to mate with the rod member in a substantially similar adjacent device on the other side of the holder and to pivot thereabout so as to form a tongue and groove pivot means,

the U-shaped sheet holder being in the form of a short clip and at least two clips being required to grip the paper sheets.

4,521,036

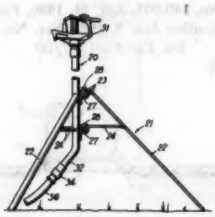
SPRINKLER HEAD SUPPORT

William T. Howell, Jr., Rte. 6, Box 39; John T. Howell, Rte. 4, Box 398A, and Danny T. Howell, Rte. 4, Box 398, all of Eastman, Ga. 31023

Filed Jan. 26, 1982, Ser. No. 342,823

Int. Cl.³ F16L *3/00*

U.S. Cl. 285—61 **3 Claims**



1. A knock-down sprinkler head support comprising a standpipe having screw-threaded end portions, spaced aligned apertured mounting brackets fixed on the standpipe and projecting from one side thereof with their apertures in coaxial relationship, a tripod support for the standpipe including inclined circumferentially spaced separately formed legs, the legs having upper end apertured tabs resting in coaxial stacked relationship on one of said standpipe mounting brackets and the legs having struts fixed thereto below said tabs and being apertured and resting on the other standpipe mounting bracket in stacked relationship, the apertures of said tabs and struts being coaxially aligned and in registration with the apertures of the standpipe mounting brackets, and a single pair of separable fasteners engaged with the apertures of said tabs and struts and the apertures of the standpipe mounting brackets beneath the tabs and struts.

4,521,037

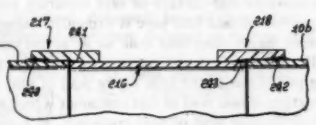
PIPE COUPLING

Granville S. Knox, 1323 Santa Margarita Dr., Fallbrook, Calif. 92028

Continuation-in-part of Ser. No. 524,248, Aug. 18, 1983, abandoned. This application Aug. 20, 1984, Ser. No. 642,261

Int. Cl.³ F16L *55/18*

U.S. Cl. 285—15 **9 Claims**



1. In a coupling for joining and sealing two pipe sections having elongated outer surfaces and end terminals, the combination with said pipe sections comprising

(a) an extension comprising a length of tubing substantially bridging the space between the pipe terminals to form joints therewith,

(b) twin collars telescopically movable axially of the extension into coupling positions spanning the respective joints,

(c) each collar having a first aligning bore sized for close slidable engagement with the outer end surface of the extension and a second aligning bore sized for close slidable engagement with the outer end surface of said pipe section and when in said coupling position holding said pipe section and extension ends in close axial alignment,

(d) said first aligning bore having an axially extending first counterbore providing a predetermined annular space between said collar and the extension and said second aligning bore having an axially extending second counterbore providing a predetermined annular space between said collar and said pipe end when in said coupling position,

(e) and a liquid bonding agent in both said spaces and bonding said collar to the extension and pipe end and sealing therebetween,

(f) one of said counterbores extending between said first and second aligning bores.

4,521,038

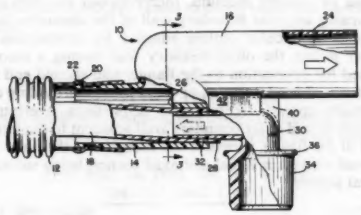
SAFETY CONNECTOR FOR FLEXIBLE TUBE DEVICE

David E. Cerny, Hoffman Estates, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Filed May 20, 1983, Ser. No. 496,558

Int. Cl.³ F16L *35/00*

U.S. Cl. 285—24 **10 Claims**



1. A connector comprising:

a rigid tubular element comprising a first cylindrical element which is joined at its side to a second cylindrical element;

a first tubular end portion is formed by said first cylindrical element;

a second tubular end portion is formed by said second cylindrical element;

an offset flow passage is formed between said first tubular end portion and said second tubular end portion;

a first flexible tubing having an end portion concentrically frictionally positioned on said first end portion;

an internal tubular stub having an external diameter less than the internal diameter of said first cylindrical element is disposed within said first cylindrical element and has an opening that communicates with the exterior of said tubular element;

a second flexible tubing having an external diameter that is less than the internal diameter of said internal tubular stub, extends through said first flexible tubing and is inserted through said internal tubular stub and extends beyond said stub to the exterior of said tubular element providing a visible exposed end position of said second flexible tubing;

an elbow-shaped locking piece having a spout that is frictionally positioned within said second flexible tubing thereby locking said second flexible tubing within said stub; and

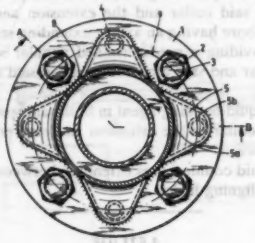
guide means associated with said second cylindrical element and elbow-shaped locking piece which hold said locking piece in proper position.

4,521,039

CONNECTOR FOR HEATED PIPES

Wilhelm Schulz, Kuhleshütte 85, 4150 Krefeld, Fed. Rep. of Germany

Filed Feb. 3, 1983, Ser. No. 463,510
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204561; Mar. 6, 1982, 3208106
Int. Cl.³ F16L 53/00
U.S. Cl. 285—41 3 Claims



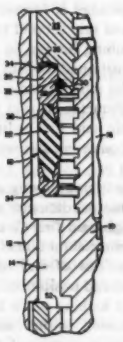
1. In a connector for use with a pipeline section, flange and tubular jacket surrounding the pipeline section with the pipeline section having one end to which the flange is affixed, the flange having bores therethrough for passing fixing bolts and at least three channels for heating and cooling medium to pass through arranged on the same pitch circle, and the tubular jacket surrounding the pipeline section to allow passage of the heating or cooling medium, therebetween the improvement comprising an outer boundary wall of the connector having a first end of circular outline adapted for connection to the tubular jacket, the outer boundry wall having a second end adapted for connection to the flange, said second end formed with a star-shaped, serrated or wavy outline providing circumferentially spaced recesses and projections overlying said channels in said outer boundary wall adjacent to the fixing bolt bores of the flange, access to the fixing bolts the outer boundary wall viewed in radial and axial section being substantially conical shaped.

4,521,040

COMBINED METAL AND ELASTOMER SEAL

Richard W. Slyker, and John R. Pettit, both of Ventura, Calif., assignors to Vetco Offshort, Inc., Ventura, Calif.

Filed Sep. 17, 1982, Ser. No. 419,270
Int. Cl.³ F16L 21/04
U.S. Cl. 285—140 13 Claims



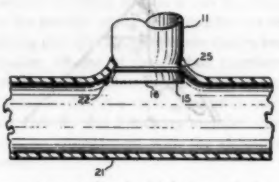
1. A seal for an annular space comprising: a lower metallic seal ring; an upper metallic seal ring; an elastomeric seal ring interposed between said metallic seal rings, and having a thickness greater than each of said metallic rings; at least said lower ring having a pair of flexible lip portions extending upwardly with the outer surface of each lip linear for a majority of the length, said elastomeric seal ring including a substantial portion located between said flexible lip portions whereby axial force on said metallic rings compresses said elastomeric seal ring which in turn forces said lip portions outwardly; said lips having increasing thickness with length from the tip through a majority of the length, and a reduced thickness near the base of each of said lips.

4,521,041

PIPE CONNECTION

Russell C. Cox, and Arthur H. McElroy, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 140,901, Apr. 16, 1980, Pat. No. 4,345,956. This application Jun. 9, 1982, Ser. No. 386,560
Int. Cl.³ F16L 41/00
U.S. Cl. 285—156 5 Claims



1. A pipe connection comprising:

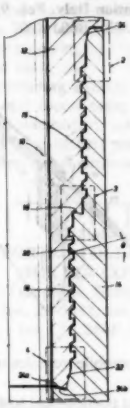
a first pipe having an inwardly tapered first end portion, formed thereon when cold by deforming the pipe end at least said inwardly tapered first end portion of said first pipe comprising a synthetic thermoplastic polymeric material which has a plastic memory; and

a container, at least a portion of a wall of said container comprising a synthetic thermoplastic polymeric material which has a plastic memory, said portion of said wall of said container having a hole formed therein through which a portion of said inwardly tapered first end portion is inserted in such a manner that the transverse end surface of said inwardly tapered first end portion is substantially flush with the inside surface of the portion of the wall of said container which is substantially adjacent the hole in the wall of said container, the portion of said wall of said container which is adjacent the hole in said wall of said container being deformed while cold extend outwardly from the remaining portion of said container, said inwardly tapered first end portion of said first pipe, as a result of its plastic memory, being under a stress pressing towards the portion of said wall of said container which is adjacent the hole in said wall of said container such that the transverse end surface of said inwardly tapered first end portion of said first pipe is expanded outwardly to a diameter larger than said hole so as to prevent said inwardly tapered first end portion of said first pipe from being pulled out of the hole in the wall of said container, the portion of said wall of said container which is adjacent the hole in said wall of said container, as a result of its plastic memory, being under a stress pressing towards said inwardly tapered first end portion of said first pipe such that at least a portion of the edge of said hole presses against said inwardly tapered first end portion of said first pipe so as to prevent said inwardly tapered first end portion of said first pipe from being inserted further into said container.

4,521,042
THREADED CONNECTION

Jan W. Blackburn, Kingwood, and Burl E. Baron, Houston, both of Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Jul. 5, 1983, Ser. No. 510,881
Int. Cl.³ F16L 25/00
U.S. Cl. 285—334 5 Claims



1. A pipe joint of coaxially mating pin and box members comprising,

first and second pairs of interengaged threads on the respective members, the first pair of threads axially spaced from the second pair of threads, the threads of the respective members having negatively angled load flanks,

a pair of generally positively angled frusto-conical intermediate shoulders on the members disposed axially between the first and second pairs of threads, the angle of the intermediate positive angled shoulder on the box member being greater than the intermediate angled shoulder on the pin, the dissimilar angles of the positive angled intermediate shoulders effecting an intermediate seal on the intermediate shoulders when the members are fully interengaged,

cooperating external frusto-conical sealing surfaces respectively on the outer end of the counterbore of the box member and the inner end of the pin member,

the external sealing surface of the box member being an annular outwardly facing external shoulder inclining outwardly at an angle with respect to the axis of the box member,

the external sealing surface of the pin member inclining inwardly toward the end of the pin member, the angle of incline of the external pin shoulder being substantially the same as that of the external sealing surface, and

cooperating non-engaging protective shoulders on the pin and box members adjacent the external sealing surfaces of the pin member and the external sealing surface of the box member.

4,521,043
TRASH BAGGING APPARATUS

Robert L. Wilsford, deceased, late of Fort Worth, Tex. (by JoAnn Wilsford, executor), assignor to Jo Ann Wilsford, Fort Worth, Tex.

Filed May 11, 1984, Ser. No. 609,310
Int. Cl.³ A47F 13/06; A47L 13/52
U.S. Cl. 294—19.1 7 Claims

1. Trash bagging apparatus for facilitating emplacing trash in a flexible container, comprising:

a. two flat side sheets hingedly connected together at their interior edges with their exterior edges free to be pivoted about the hinged connection to be moved together and to be opened up to engage a flexible container for trash or the like; at least one of the side sheets being adapted to lie flat on the ground for having the trash swept thereonto; said side sheets being elongate to protrude upwardly beyond the trash container emplaced on its bottom for a distance sufficient to have trash swept onto said side sheet; and

b. biasing means for biasing said exterior edges toward their extremities in which position said hingedly connected sides form a substantially planar structure; said limit of travel of said side sheets being defined by the flexible

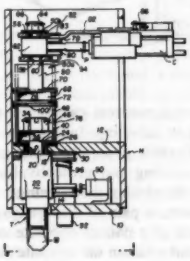
container engaging the side sheets for receiving the trash when the side sheets are stood upwardly to dump the trash into the flexible container;

wherein there is provided front bag holding means for holding the top of the flexible container on the front of said side sheets when said side sheets are raised to dump trash into the flexible container.

4,521,044
TWISTLOCK OPERATOR

William S. Appleman, Durham, and James D. Sturgill, Roxboro, both of N.C., assignors to RPC Corporation, South Roxboro, N.C.

Filed Mar. 21, 1983, Ser. No. 477,323
Int. Cl.³ B66C 1/66
U.S. Cl. 294—82.24 19 Claims



1. A displacable rotation assembly for a twistlock mechanism operably associated with a drive mechanism having a fixed axis and an angularly displacable twistlock with a pivot axis normally positioned along said fixed axis; comprising:

(a) first means coupled with said drive mechanism;

(b) second means coupled with said twistlock;

(c) an angularly displacable operator having an angularly movable axis normally positioned on said fixed axis and connecting said first and said second means;

(d) whereby said operator will be displaced from said fixed axis while maintaining coupling between said first and said second means when said twistlock is angularly displaced from said fixed axis;

(e) said first means includes a first flat actuator having a shaft

extending therefrom and said shaft connected to said drive mechanism;

(f) said second means includes a second flat actuator;

(g) said operator includes a tube member having an upper and a lower end and wherein said first actuator is pivotally associated with said upper end and said second actuator is pivotally associated with said lower end;

(h) each of said first and second actuators includes arcuate bearing surfaces cooperating with said tube member;

(i) said bearing surfaces of said first and said second actuators have substantially equal radii of curvature; and,

(j) said first and said second actuators are substantially rectangularly-shaped.

4,521,045

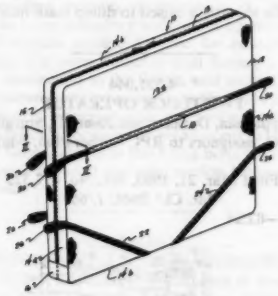
MATTRESS CARRIER

Cecil C. Hart, 108 Pine Acres Dr., Spartanburg, S.C. 29302

Filed Sep. 2, 1983, Ser. No. 529,095

Int. Cl.³ B65D *65/00*

U.S. Cl. 294—149 **4 Claims**



1. An improved mattress carrier for protecting a mattress and facilitating its handling during delivery to a point of use comprising a flexible, generally rectangular cover having an opening for receiving and protectively enclosing a mattress therein, means for closing the opening to contain the mattress within the cover, a pair of hand-engageable handle means attached to each of a pair of opposite ends of the cover and located in spaced relation on opposite sides of a mid-point of the length of said opposite ends for lifting and manipulating the carrier during transportation of a mattress therein, a first set of reinforcing bands of flexible material attached to and extending in opposed relation to each other along opposite sides of the cover generally perpendicular to said opposite ends of the cover, the ends of each of said first set of bands terminating in loops which comprise a first of said pair of hand-engageable handle means at each end of the cover, and second and third sets of reinforcing bands respectively attached to and extending in opposed relation diagonally across adjacent lower corners of opposite sides of the cover, the ends of each of said second and third sets of bands terminating in loops which comprise the second of said pair of hand-engageable handle means, whereby the spaced pairs of handle means at each of said opposite ends of the cover may be engaged by a workman to carry a mattress within the carrier.

4,521,046

CELL STRUCTURE SUN VISOR FOR AUTOMOBILE VEHICLES INCLUDING RETENTION AND SNAP-ACTION POSITIONING MEANS

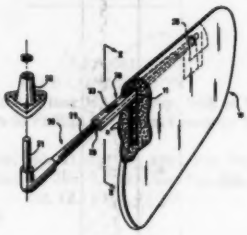
Giovanni Foggini, Turin, Italy, assignor to Lear S.n.c. di Foggini & C., Orbassano, Italy

Filed Jan. 28, 1983, Ser. No. 461,815

Claims priority, application Italy, Feb. 9, 1982, 67146 A/82

Int. Cl.³ B60J *3/02*

U.S. Cl. 296—97 K **4 Claims**



1. A sun visor for automobile vehicles of the type having a cell structure comprising:

a wire rod having a first portion bent to a right angle with an end thereof attached to a support for engagement with an automobile body roof panel and a second portion engaging with one cell of the cell structure

at least a longitudinal groove formed along at least one portion of said wire rod second portion

an insert of a high strength polymeric material interposed between said cell and said wire rod second portion and surrounding said second portion

at least one longitudinal projecting rib formed internally along said insert engaging said longitudinal groove

said longitudinal groove being adapted to receive said longitudinal rib for elastic release engagement positioning said sun visor

said insert having a length equal at least one half the length of said wire rod.

4,521,047

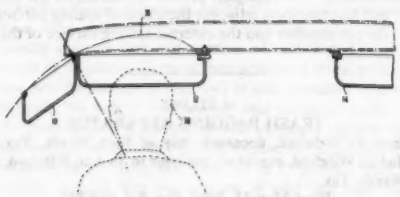
SUN VISOR ARRANGEMENT

Edwin F. Saxman, Allentown, Pa., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Mar. 22, 1983, Ser. No. 477,658

Int. Cl.³ B60J *3/02*

U.S. Cl. 296—97 K **6 Claims**



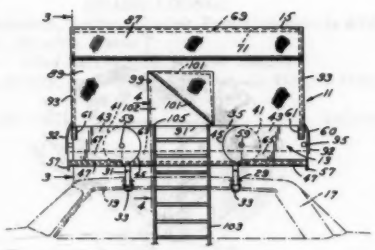
1. A sun visor arrangement for a vehicle having a windshield and left and right doors adjacent the ends of the windshield comprising:

(a) a first visor at one side of the windshield and a second visor positioned adjacent said first visor;

(b) said first visor being arranged for pivotal movement between a first position adjacent the windshield and a second position adjacent one of said doors;

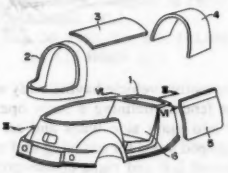
(c) said second visor being arranged for movement about a pivotal axis between a first position adjacent the windshield and to one side of said first visor and a second position substantially in the first position of said first visor;
(d) said first visor including a first rod extending from the free end thereof;
(e) said second visor including a second rod having a portion extending beyond the pivot axis of said second visor on the side of the pivot axis opposite the free end of said second visor for receiving said first rod to support the free end of said first visor; and
(f) said member including a recess for frictionally receiving said first rod, said recess being open on the side facing away from said windshield, whereby when said second visor is moved from its first position towards its second position, said first rod is automatically released from said recess.

4,521,048
VEHICLE SUPPORTED COLLAPSIBLE BED WITH SHELTER COVER
Ivan Prvanoff, 8786 Evangeline, Dearborn Heights, Mich. 48127
Filed Dec. 22, 1982, Ser. No. 452,138
Int. Cl.³ B60P 3/34
U.S. Cl. 296—160 **10 Claims**



1. A collapsible bed adapted for mounting upon a vehicle roof and having an open position and a collapsed position comprising;
a horizontal center support panel overlying and secured to the roof;
a pair of laterally spaced upright center sections mounted and secured upon said support panel along its sides;
longitudinally spaced pairs of laterally spaced upright end sections;
each pair of end sections respectively bearing against one of the ends of said center sections, with the one ends of each pair of end sections being pivotally mounted and supported upon one of the ends of said center sections respectively, and extending longitudinally outward as extensions thereof when said bed is in said open position;
a horizontal end support panel spanning each of said pairs of end sections and secured to the undersides thereof, coplanar with said horizontal support panel, forming an extension thereof when said bed is in said open position;
said horizontal end support panel having a storage space associated therewith;
said center and end support panels respectively adapted to mount thereon corresponding mattress sections;
and an elongated flexible sheet having an intermediate portion and a pair of end portions, said intermediate portion underlying and secured to the undersurface of said horizontal center support panel in both of said positions and the end portions of said flexible sheet being received within said storage space when said bed is in said open position and extending around said end sections when said bed is in a collapsed position;
said end sections and corresponding end support panels adapted to rotate approximately 180 degrees about their pivotal mountings into registry with said center sections when said bed is in a collapsed position;
and with the corresponding end portions of said flexible sheet overlying and spanning said center sections, the end portions of said flexible sheet not received within said storage space extending around and enclosing the pivot ends of said center and end sections.

4,521,049
SMALL CAR BODY
Hideyuki Genma, Hamamatsu, and Yoshiaki Sugita, Higashi Wakabayasi, both of Japan, assignors to Suzuki Motor Company Limited, Japan
Filed Aug. 28, 1981, Ser. No. 297,180
Claims priority, application Japan, Nov. 17, 1980, 55-160775; Nov. 17, 1980, 55-163471[U]; Nov. 28, 1980, 55-166608
Int. Cl.³ B62D 27/00
U.S. Cl. 296—185 **5 Claims**



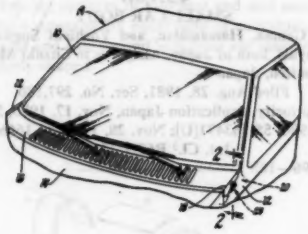
1. A small car body comprising:
a lower half part made of integrally molded synthetic resin and having a central indented area for accommodating a seat, and an outer downwardly extending skirt spaced from the indented area;
a front panel connected to and extending upwardly from said lower half part at a location between said central indented area and said skirt;
a roll bar panel connected to and extending above said lower half part at locations between said central indented area and said skirt;
a roof panel connected between said front panel and said roll bar panel;
a pair of laterally spaced longitudinal members each having low middle portions, a high front portion extending forwardly of said middle portion and a high rear portion extending rearwardly of said middle portion;
a first lateral member having a lower middle part and opposite upwardly extending ends, each upwardly extending end connected to said front portion of one of said pair of longitudinal members;
a second lateral member having a forward middle part and rearwardly extending ends, each rearwardly extending end connected to said low middle portion of one of said longitudinal members, at a forward location thereon;
a bracket plate connected between said low middle part of said first lateral member and said forward middle part of said second lateral members;
a third lateral member connected between said low middle portions of said longitudinal members at rear locations of said low middle portion;
a fourth lateral member connected between said rear portions of said pair of longitudinal member;
said pair of longitudinal, first, second third and fourth lateral members forming a chassis frame;
a plurality of fixing brackets connected to said chassis frame and said lower half part for connecting said chassis frame to said lower half part; and
suspension means for suspending a front tire between each rearwardly extending end of said second lateral member and each longitudinal member front portion respectively.

4,521,050

SHROUD TOP VENT GRILLE RETAINING MEANS

Gerald M. Rea, Sterling Heights; William G. Stoff, St. Clair Shores, and John F. Zens, Algonac, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 10, 1984, Ser. No. 579,083
Int. Cl.³ B62D 25/08
U.S. Cl. 296—192 2 Claims



1. In an automotive vehicle having body structure including left and right fenders defining a body opening, said fenders having inner and outer side walls and an outer top wall, a generally U-shaped panel for covering said opening, said panel having a top and left and right downwardly extending legs disposed within said opening, and left and right retaining means carried by the inner walls of said left and right fenders, respectively, for retaining said panel in place,

the improvement being that said left and right legs have a generally horizontally extending slot therethrough and that each of said retaining means comprises a base portion which is secured to the inner side wall of its adjacent fender a predetermined distance below the top wall of the fender,

spaced apart, upwardly extending fore, middle and aft arms integral with said base portion, said middle arm being deflectable and having a transversely extending barb at its upper free end, said barb having at least one side which is tapered, said fore and aft arms at their free ends defining a curved leaf spring,

said legs of said panel engaging said barbs on said middle arms and causing the latter to be deflected from their normal free state position until said barbs are aligned with said slots on said legs whereupon said arms self return toward their normal free state position and are disposed within said slots to retain said panel in place, said leaf springs on said fore and aft arms biasingly engaging said panel on its underside to bias the panel against the barbs to prevent rattling of the panel and to position the panel so that its outer side is flush with the outer top walls of the left and right fenders,

said legs of said panel along their edges defining an end of the slots engaging said tapered sides of said barbs when the panel is moved into engagement with the tapered sides to cause the middle arms to be deflected from their normal free state position to release the panel from the middle arms to allow removal of the panel.

4,521,051

VISOR WITH MIRROR AND STORAGE MEANS

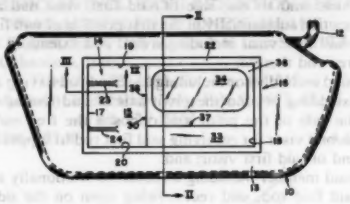
Michael J. Cody, and Scott A. Spykerman, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Sep. 15, 1983, Ser. No. 532,395
Int. Cl.³ B60J 3/02
U.S. Cl. 296—97 H 15 Claims

1. A vehicle visor and storage compartment comprising:

a visor body having a central recess formed therein which opens toward one side of said body;

a mirror panel for supporting a mirror thereon said panel coupled to said body to enclose a substantial portion of said recess and define an opening to said recess from an



edge of said panel for insertion and storage of objects within said recess and behind said panel; and

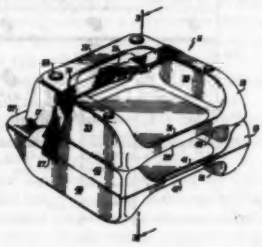
a mirror secured to said panel.

4,521,052

BOOSTER SEAT

Richard E. Cone, Dayton, Ohio, assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Filed Sep. 20, 1982, Ser. No. 420,543
Int. Cl.³ A47D 1/04; A47C 13/00
U.S. Cl. 297—3 13 Claims



1. A child's booster seat for use with an adult chain comprising

a first base having seat indentations on opposite sides thereof;

a second base having seat indentations on opposite sides thereof;

means for pivotally joining said bases at their outer periphery;

the depth of each of said seat indentations being different from the depth of each of the other said seat indentations whereby said booster seat provides four selectively different heights for the child and a back at a selected position.

4,521,053

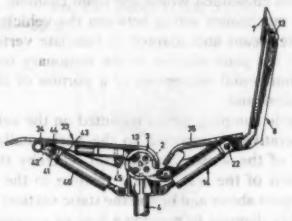
CHAIR

Peter de Boer, SV Bussum, Netherlands, assignor to Gispen+-Staalmeubel B.V., Culemborg, Netherlands

Filed Jun. 16, 1982, Ser. No. 389,037
Int. Cl.³ A47C 1/022
U.S. Cl. 297—312 11 Claims

1. A chair having a supporting frame and a seat and back-supporting assembly supported by said frame, said seat and back-supporting assembly comprising two independently movable sections, one of which is a forward seat portion having a forward margin and the other of which is a generally L-shaped portion defining a rearward seat portion and a back-supporting portion, said forward seat portion having a rearward margin and said rearward seat portion having a forward margin and such margins being disposed in spaced relation to define depression means disposed substantially closer to said back-supporting portion than to said forward margin of the forward seat portion for receiving and locating the pelvic region of a

sitting user, means for independently pivoting said seat portions to allow relative flapping motions thereof about a region adjacent said depression means, first means reacting between said forward seat portion and said frame for adjusting the



angularity of said forward seat portion relative to said rearward seat portion, and second means reacting between said rearward seat portion and said frame for adjusting the angularity of said rearward seat portion relative to said forward seat portion.

4,521,054

CHAISE LOUNGE

Didier Deconinck, Seysinnet Pariset, France, assignor to Allibert S.A., Grenoble, France

Filed Jun. 14, 1983, Ser. No. 504,250
Claims priority, application France, Jun. 22, 1982, 82 11323
Int. Cl.³ A47C *1/026*
U.S. Cl. 297—357 **2 Claims**

1. A chaise lounge comprising:

an elongated body-supporting unit formed at one end with a pair of wheels, at another end with handle means for displacement of said unit, and between said ends with a surface for supporting a body of a user; and

an adjustable inclination backrest separable from and adapted to be mounted on said body-supporting unit,

said backrest being provided with a body-engaging surface and a pair of arms projecting downwardly from the body-engaging surface,

said unit having at least one opening adapted to receive said arms, and being formed on opposite sides of said unit adjacent said arms and said at least one opening with respective rows of upwardly open notches,

each of said arms having a respective outwardly extended pin engageable in a selected notch in a respective one of said rows,

said unit being formed below said surface of said unit with two abutments at different levels and said arms being provided at free ends thereof below said surface of said backrest with a plurality of formations in the form of notches selectively engageable with said abutments whereby the orientation of said backrest is established by selection of said notches and the engagement of the free ends of said arms with said abutments and said arms are withdrawable from said at least one opening freely upwardly to separate said backrest form said unit,

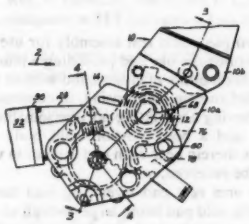
said backrest being cantilevered on said unit upon the engagement of said free ends with one of said abutments and the resting of said pins in the selected notches, said body-supporting unit comprising a pair of molded synthetic resin longitudinal members along oppposite longitudinal sides thereof between said surface of said unit and said one end thereof, each of said members being formed with a respective longitudinally extending slot receiving a respective one of said arms and adjacent a respective row of said upwardly open notches, said slots defining said opening, each of said rows of upwardly open notches being located only along an outer edge of a respective one of said slots.

4,521,055

POWER RECLINER

Chester S. Fudala, Troy, Mich., assignor to Ferro Manufacturing Corporation, Southfield, Mich.

Filed Aug. 30, 1982, Ser. No. 412,584
Int. Cl.³ B60N *1/06*
U.S. Cl. 297—362 **6 Claims**



1. A power recliner for the seat back of a vehicle seat comprising,

a relatively fixed substantially flat plate providing a seat mount,

a substantially flat tie plate parallel to and spaced from said seat mount to define an enclosure therebetween,

a hollow transmission housing in the form of a metal casting having openings at opposite sides and fixedly mounted between said seat mount and tie plate,

said housing having an integral motor support extending laterally therefrom out of said enclosure, said motor support having an opening therethrough communicating with the interior of said housing,

a first one of said openings at one side of said housing being provided with internal gear teeth to form a ring gear,

a reversible electric motor mounted directly on the motor support of said housing, said motor having an output shaft extending through the opening in said motor support into the interior of said housing,

said motor output shaft having a coaxial worm at its inner end,

a cover plate formed of a low friction plastic material fixed to said housing and covering the other opening at the other side of said housing,

a rotary transmission drive shaft journalled at one end in an opening in said cover plate and at the other end in an opening in said seat mount,

a carrier plate fixed to said drive shaft and journalled in said first opening at the said one side of said housing axially outwardly of the teeth therein,

a worm gear rotatable on said drive shaft within said housing and in mesh with said worm,

a sun gear mounted on and rotatable with respect to said drive shaft in the plane of said ring gear,

resilient means yieldably coupling said worm gear to said sun gear,

a plurality of planet gears on said carrier plate in mesh with said sun gear and said ring gear,

a drive pinion fixed to said drive shaft exterior of said housing but within the enclosure between said seat mount and tie plate,

a pivot pin extending between said seat mount and said tie plate, and

a seat back mount pivotally carried by said pivot pin and having a toothed sector in mesh with said drive pinion.

4,521,056

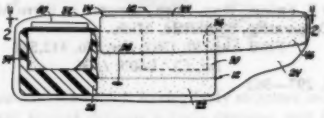
MODULAR, MULTI-POSITION ARM REST

Donald C. Lindenmuth, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1984, Ser. No. 596,056

Int. Cl.³ B60N *1/06*

U.S. Cl. 297—412 **2 Claims**



1. A two piece arm rest assembly for use on the inside of a vehicle door or the like and providing a plurality of configurations usable on doors of either hand with or without a receptacle included therein, comprising, in combination,

a base having a mounting portion joinable to the inside of a door and a body portion, said body portion having a recess therein near each end thereof in which a receptacle may be received,

and an arm rest pad overlying said base and attachable thereto, said pad being large enough to cover both of said recesses in the body portion and sufficiently shiftable longitudinally with respect to said base to uncover either of said recesses before being attached to said base,

whereby the pad may be attached to the base so as to be usable on doors of either hand in a first configuration covering both recesses, and in a second configuration covering one of said recesses, and a third configuration covering the other of said recesses, so that the arm rest assembly may be attached to doors or the like of either hand with the uncovered recess in either orientation with respect to the pad to receive a receptacle or with neither recess uncovered when the arm rest assembly is not to receive a receptacle.

4,521,057

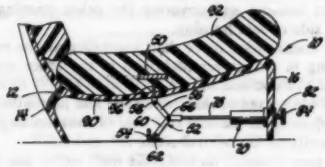
AUTOMOBILE SEAT WITH ADJUSTABLE DAMPING

John H. Varterasian, Livonia, and Richard J. Granzotto, Southfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 16, 1983, Ser. No. 466,857

Int. Cl.³ A47C *3/00*

U.S. Cl. 297—455 **1 Claim**



1. A vehicle seat comprising:

a stationary seat support;

a seat cushion of resilient foam vertically compressible to a static vertical condition relative to the stationary seat support corresponding to a certain static occupant load upon the seat and further resiliently movable above and below the static vertical position in response to vehicle vibrations;

plate means embedded within the foam cushion;

a scissors mechanism acting between the vehicle body and the plate means and adapted to translate vertical movement of the plate relative to the stationary seat support into a horizontal movement of a portion of the scissors mechanism; and

an adjustable damping means mounted on the vehicle body and operatively connected to the horizontally movable portion of the scissors mechanism whereby the vertical movement of the seat cushion relative to the stationary seat support above and below the static vertical position is adjustably damped to provide a desired occupant ride.

4,521,058

ROTARY CUTTER HEADS FOR MINING MACHINES

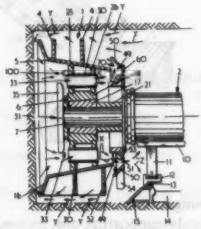
Brian A. Eagles, Johannesburg, South Africa, and Albert G. French, Willington, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Sep. 14, 1982, Ser. No. 418,077

Claims priority, application United Kingdom, Oct. 13, 1981, 8130806

Int. Cl.³ E21C *25/10*

U.S. Cl. 299—81 **9 Claims**



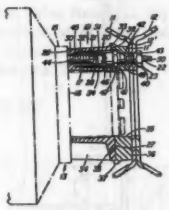
1. A rotary cutter head for a mining machine, comprising a hub assembly drivably mountable on a rotary drive unit, a barrel component secured around and co-axial with, the hub assembly, air flow inducing means for inducing air flow along a first path section within the barrel component and in a general direction towards the mining machine side of the cutter head, and along a second path section outside the barrel component and in a general direction away from the mining machine side of the cutter head, air flow deflector means for urging a first portion of the induced air flow flowing along the first path section towards the air flow flowing along the second path section, the air flow deflector comprising an annular guide inclined to the hub axis, and aperture defining means for permitting a second portion of the induced air flow flowing along the first path section to flow along a third air flow path section leading away from the machine side of the cutter head, the inclined air flow guide being located adjacent to the machine side of the barrel component and being spaced from the barrel component to define further aperture means for said first portion of the air flow deflected from section towards the second path section.

4,521,059

DUAL WHEEL ADAPTER

Minoru Saruwatari, Calgary, Canada, assignor to Qsine Corporation Limited, Calgary, Canada

Filed Mar. 9, 1983, Ser. No. 473,493
Claims priority, application Canada, Mar. 9, 1982, 397899
Int. Cl.³ B60B *11/00, 37/00*
U.S. Cl. 301—36 R 12 Claims



7. An adapter for mounting dual wheels on a vehicle hub having a flange with an annular end face and a plurality of threaded studs projecting from said face, said adapter comprising spacer means including an integral body having an inner radial end surface for engagement with the end face of said flange and an opposite outer radial end surface, said body having a plurality of openings arranged for alignment with said studs and extending axially between said opposite end surfaces thereof, each of said openings having an inner reduced portion of reduced diameter to closely receive one of said studs and an enlarged outer portion extending from said reduced portion to said outer end surface, a seat being provided in each opening between the reduced and enlarged portions, a plurality of elongated studs having at an inner end thereof an axial bore for threaded engagement with the studs of the vehicle hub, said elongated studs each having a seat for engagement with said seat in said opening when threaded on the hub stud and an outer end extending outwardly beyond said outer end surface of said body, said outer ends of said elongated studs being externally threaded for receiving clamping nuts seated against an outer one of said dual wheels having openings aligned with and receiving the outer ends of said elongated studs for clamping the dual wheels outwardly of said spacer means, each elongated stud including a bolt head portion inwardly of the outer threaded end, the distance between said seat and said bolt head portion of said elongated stud being greater than the length of said enlarged portion of the opening in said body whereby said bolt head portion is disposed outwardly of said outer end surface of said body when said elongated studs are threaded onto the hub studs, and wherein said spacer means further includes a second body having an inner radial surface and an outer radial surface and a plurality of openings extending axially from said inner to said outer radial surface thereof and being aligned with said openings of the first body, said openings of said second body having enlarged portions adjacent said inner radial surface thereof for reception of said bolt head portion of said elongated stud.

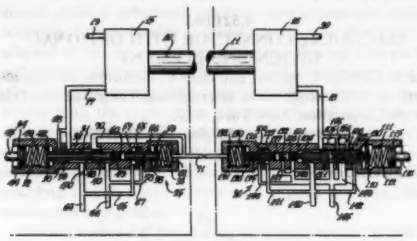
4,521,060

HYDRAULIC ASYMMETRY DETECTOR

David J. Linton, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 17, 1983, Ser. No. 553,743
Int. Cl.³ B60T *13/22*
U.S. Cl. 303—71 14 Claims

1. A hydraulic asymmetry detector for sensing differential movement of a pair of movable interconnected actuating mechanisms and operable to set a brake when asymmetry is detected comprising, a pressure-regulator valve and a sensor valve, means whereby the pressure-regulator valve sets a control pressure proportional to movement of one actuating mechanism, means associated with the sensor valve for detecting a difference in a force resulting from said control pressure and a force proportional to movement of the other actuating mecha-



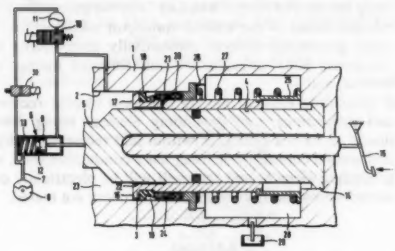
nism, and means operable to set said brake when said force difference is detected.

4,521,061

HYDRAULIC BRAKE SYSTEM WITH SLIP CONTROL

Juan Belart, Walldorf; Jochen Burgdorf, Offenbach-Rumpenheim; Lutz Weise, Mainz; Dieter Kircher, Frankfurt am Main, all of Fed. Rep. of Germany, and André F. L. Goossens, Rumst, Belgium, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jun. 24, 1983, Ser. No. 508,294
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1982, 3226987
Int. Cl.³ B60T *8/10, 13/00, 8/12*
U.S. Cl. 303—114 19 Claims



1. A hydraulic brake system for motor vehicles with slip control comprising:

a master brake cylinder having at least one master cylinder piston operating a vehicle wheel brake, hydraulic medium removed from said wheel brake during slip control being supplied to said wheel brake from an auxiliary pressure source via a gasket acting as a first check valve disposed on the circumference of said master cylinder piston;

a hollow positioning piston axially guided in and sealed to an axial bore of a housing, said positioning piston having an end surface thereof pressurized by said auxiliary pressure source during slip control to limit the operating stroke of said master cylinder piston; and

a master cylinder piston rod axially guided in and sealed to the inner surface of said positioning piston;

said positioning piston being a stepped piston having a large diameter portion, a smaller diameter portion sealed at a given point with respect to said axial bore and a step between said smaller diameter section and said larger diameter portion, said step and said given point defining an annular chamber having a volume dependent on movement of said master cylinder piston rod, said chamber having a throttling connection to said end surface disposed on the surface of said larger diameter portion remote from said step, said throttling connection having a

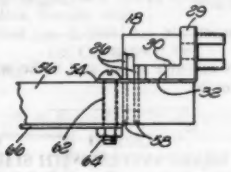
second check valve therein which opens towards said annular chamber.

4,521,062

ELECTRICAL CONNECTOR WITH OPTIONAL GROUNDING ELEMENT

Peter A. Kurbikoff, Agoura, and Gary C. Bethurum, El Segundo, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 26, 1983, Ser. No. 517,196
Int. Cl.³ H01R *4/66, 13/648*
U.S. Cl. 339—14 R **10 Claims**



1. An electrical connector member adapted to mate with a second connector member which is either shell-less or embodies a conductive shell, and has a recess formed in its forward mating end, comprising:

a shell-less insulative connector body having a plurality of projections spaced about its outer periphery adjacent to the forward mating end of the connector body;

the horizontal and vertical dimensions of said connector body as defined by the outer surfaces of said projections being selected to permit a sliding fit of the connector body into the recess of the second connector member;

a metal grounding element substantially surrounding said connector body adjacent to said forward mating end thereof; and

said grounding element having openings therein receiving said projections, said grounding element being dimensioned to have a sliding fit within said recess whereby, if said second connector member has a conductive shell, said grounding element and the shell will be electrically connected when the two connector members are mated.

4,521,063

PRINTED CIRCUIT BOARD LOCK

Thomas A. Milc, Curran, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed Jul. 1, 1982, Ser. No. 394,424
Claims priority, application Canada, Feb. 19, 1982, 396666
Int. Cl.³ H01R *13/54;* H05K *1/14*
U.S. Cl. 339—17 LM **15 Claims**

1. A printed circuit board lock comprising:

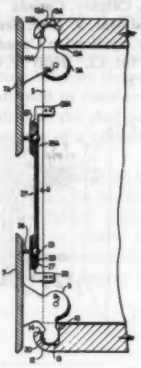
(a) a lever,

(b) means for rotatably attaching the lever to a printed circuit board at a fulcrum point spaced from the axis of the lever,

(c) a latch fixed to the lever at a position closer to the lever and closer to one end of the lever than the fulcrum point, comprised of an indented portion and a protrusion having an orthogonal axis parallel to the axis of the fulcrum, and having a periphery opposite to the lever which describes at least a 180° segment of a circle extending from a line parallel to the lever passing approximately through the axis of the fulcrum,

(d) guide means for directing the printed circuit board along a straight line, and

(e) a hook connected to said guide means, having a lip portion thereof for cooperatively engaging said latch, and a bottom portion thereof being a distance from the fulcrum point no shorter than the distance between the fulcrum point and the edge of the latch opposite the fulcrum point, whereby said indentation of the latch is engaged and locked into the lip of said hook in response to the latch being rotated over centre relative to the fulcrum point, such that the printed circuit board is securely retained in the event of external vibration.

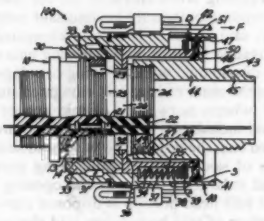


4,521,064

ELECTRICAL CONNECTOR HAVING A MOISTURE SEAL

Anthony W. Knapp, Laurens, and Dee A. Werth, Bainbridge, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed May 11, 1983, Ser. No. 493,497
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—45 M **10 Claims**



1. An electrical connector assembly having a moisture seal, the assembly comprising: a pair of mated electrical connector members with one of said connector members including a rearward end portion; and coupling means mounted on one of said connectors for releasably coupling the connector members together, said relesable coupling means including a spring retainer mounted to the one connector, a tubular sleeve having its interior wall circumposed about and mounted for longitudinal movement rearwardly of said spring retainer, and a spring disposed in said retainer for resisting rearward movement of said sleeve, said moisture seal sealing said coupling means against the entry of moisture, said moisture seal being characterized by:

an adaptor mounted to the rearward end portion of said one connector member, said adaptor including a radial collar defining a planar forward face spaced longitudinally rearward from said spring retainer and an outer circumferential face spaced radially inward from the interior wall of said sleeve to define an annular air space (S) therebetween; and

a one-piece, substantially flat and annular shaped seal mem-

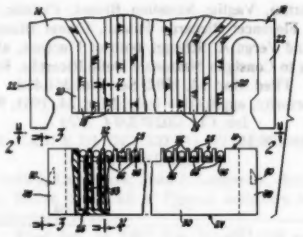
ber bonded to the forward face of said collar, said seal member being comprised of a spongy elastic foam and having a forward surface deformably compressed against the spring retainer and its outer periphery deformably compressed against the interior wall of said sleeve.

4,521,065

SOCKET CONNECTOR FOR PARALLEL CIRCUIT BOARDS

Charles R. Nestor, Niles; Robert G. Plyler, Vienna, and William E. Cross, Brookfield, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 27, 1983, Ser. No. 536,303
Int. Cl.³ H01R *9/09*
U.S. Cl. 339—75 MP **12 Claims**



1. An electrical socket connector for connecting the ends of a plurality of parallel circuit boards, comprising

a dielectric connector body of box-like construction having side walls, end walls and a plurality of spaced partition walls which define a row of cavities which have openings at the top of the connector body,

a first and a second series of aligned slots in the partition walls which are open at the top of the connector body for receiving respective ends of first and second circuit boards in the row of cavities,

a lock nib extending into each cavity from an end wall or a partition wall defining the cavity, and

a plurality of sinuous contact strips disposed in the respective cavities,

each said contact strip having resilient U-shaped clip portions alinged with the first and second series of aligned slots, respectively, and an intermediate U-shaped locking portion,

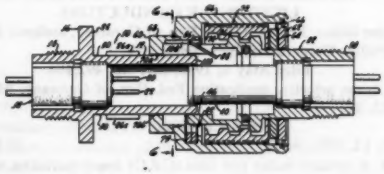
each said contact strip being insertable into a respective cavity through the opening at the top of the connector body and individually retained therein by cooperation of the locking portion and the lock nib.

4,521,066

ELECTRICAL CONNECTOR WITH NON-PRECOCKABLE COUPLING RING

Hans I. Kempe, Redlands, Calif., assignor to The Deutsch Company, Electronic Components Division, Banning, Calif.

Filed Apr. 2, 1984, Ser. No. 595,687
Int. Cl.³ H01R *13/623*
U.S. Cl. 339—89 M **16 Claims**



1. In an electrical connector having first and second connector parts adapted to be connected to one another by relative axial motion and including mutually interengagable registration elements that allow connection of the parts in a predetermined relative rotational position, said connector having a coupling ring rotatably engaged with said first part and adapted to engage said second part for driving said parts together after the parts have been partially connected, said coupling ring having coupling ring registration elements in registration with the registration elements of said first part in an aligned position of said coupling ring to permit relative axial motion of the parts, said coupling ring registration elements preventing connection of said parts to each other when said coupling ring is rotated from said aligned position, the improvement comprising

locking means for preventing relative rotation of said coupling ring and said first part, and

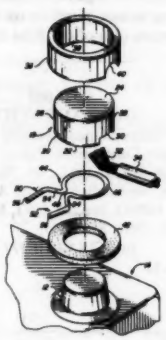
means responsive to partial connection of said first and second parts for disabling said locking means, whereby said coupling ring can be rotated relative to said first connector part only after partial connection of said parts.

4,521,067

NON-CONDUCTIVE BATTERY CABLE CONNECTOR AND ELECTRICALLY CONDUCTIVE CLIP FOR USE THEREWITH

Raymond A. Dufresne, 527 W. Townley Ave., Phoenix, Ariz. 85021

Continuation-in-part of Ser. No. 196,868, Oct. 14, 1980, Pat. No. 4,372,636, and a continuation-in-part of Ser. No. 124,979, Feb. 27, 1980, abandoned, and a continuation-in-part of Ser. No. 135,348, Mar. 31, 1980, abandoned. This application Feb. 2, 1983, Ser. No. 463,281
Int. Cl.³ H01R *11/22, 11/26*
U.S. Cl. 339—237 **13 Claims**



1. An electrically conductive clip in combination with an electrically non-conductive battery cable clamp, comprising:

(a) an electrically non-conductive battery cable clamp positionable on a battery post for electrically connecting a battery cable directly to the battery post; and

(b) an electrically conductive clip for permitting electrically conductive connection to the battery post, said clip including,

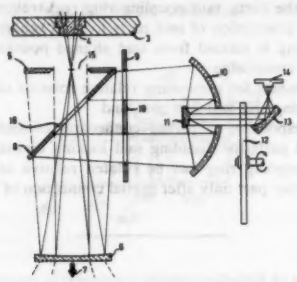
I. a generally circular portion having a periphery with a radial gap therein and arrangeable in substantially circumscribing electrically conductive contact on the battery post beneath said battery cable clamp,

II. a pair of substantially parallel, coextensive legs extending integrally from said circular portion for engagement by a suitable electrical connector.

4,521,068
COOLED FIELD OPTICAL SYSTEM FOR INFRARED TELESCOPES

Joachim Schulte in den Bäumen, Aalen-Röthardt, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Apr. 13, 1983, Ser. No. 484,644
Int. Cl.³ G02B *23/02*
U.S. Cl. 350—1.1 **11 Claims**

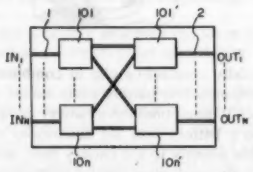


1. A cooled field optical system for uncooled infrared telescopes, comprising a telescope having a primary mirror (1) with a central hole, a secondary mirror (2), and a cooled diaphragm (9), said telescope including a field optical system producing an intermediate image of the exit pupil of the telescope at the location of said cooled diaphragm (9), characterized by the fact that behind a focal plane of the telescope limited by a field diaphragm (5) there is arranged a mirror (6) which reflects back the incident radiation coaxially, the focal length of said mirror and its distance from said field diaphragm (5) being so dimensioned as to produce in the vicinity of said field diaphragm (5) an image of the exit pupil of the telescope, central vignetting in said pupil image being greater than or equal to the aperture (15) of the field diaphragm (5).

4,521,069
OPTICAL SWITCH

Masahiro Ikeda, Tokyo, Japan, assignor to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Apr. 1, 1982, Ser. No. 364,486
Claims priority, application Japan, Apr. 1, 1981, 56-47264; Sep. 22, 1981, 56-148781; Sep. 25, 1981, 56-150723; Nov. 9, 1981, 56-178416; Feb. 9, 1982, 57-18117
Int. Cl.³ G02B *5/174*
U.S. Cl. 350—96.13 **12 Claims**

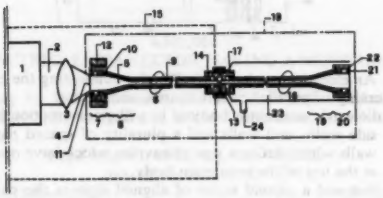


1. An optical switch element comprising:
a semiconductor substrate,
a P-N junction having a P-type semiconductor layer, a N-type semiconductor layer, and an active layer between said P-type semiconductor layer and said N-type semiconductor layer, said P-N junction integral with said semiconductor substrate,
waveguide means coupled to said active layer for applying an input optical signal to said active layer, and for receiving an output optical signal, and
means for applying an injection current in the forward direction in said P-N junction for switching ON and OFF an optical signal wherein the wavelength of an input optical signal is close to the center of gain spectrum defined by the structure of said P-N junction, and wherein said injection current when the present switch element is in the ON state is less than oscillation threshold current, and said injection current is zero when the present switch element is in the OFF state.

4,521,070
HIGH POWER LASER RADIATION CONVEYING DEVICE UTILIZING VARIABLE SECTION FIBER OPTICS

Stefano Sottini, Vaglia; Massimo Brenci, Pistoia; Giancarlo Righini, Florence; Riccardo Falcini, Campi Bixenzio; Vera Russo, and Verga A. Scheggi, both of Florence, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Mar. 24, 1982, Ser. No. 361,416
Claims priority, application Italy, Mar. 24, 1981, 9367 A/81
Int. Cl.³ G02B *5/14, 7/26*
U.S. Cl. 350—96.15 **28 Claims**



25. A laser radiation conveying device for high power radiation, characterized in that it comprises:
a connector for optical fibers including an input section and an output section;
a first guide coupled stiffly to a laser source, made of a varying-diameter section optical fiber core, a mantle and an external coating of plastic material, and including an input terminal face, and an output terminal face inserted into said input section of said connector for optical fibers;
a second guide having an optical fiber core, a mantle and an external plastic coating, and including an input terminal face inserted into said output section of said connector for optical fibers, and an output terminal face; and
said connector for optical fibers comprises an optical fiber core, a mantle about said optical fiber core, an external coating about said mantle, an input terminal face of said optical fiber core equal in area to said output terminal face of said first guide optical fiber core, and an output terminal face of said optical fiber core equal in area to said input terminal face of said second guide optical fiber core.

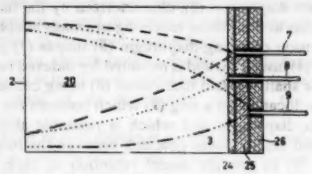
4,521,071
GRADED INDEX ROD LENS COMPRISING LIGHT-WAVE CONDUCTORS

Heinz Böhm, Erlangen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1983, Ser. No. 492,106
Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3217984
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.18 **10 Claims**

3. A graded-index rod lens (GRIN lens) including several coupled light-wave conductors for optical data communication systems, the improvement therein comprising a profile

provided on an end face of said GRIN lens, said profile including coupling areas for said light-wave conductors, said profile



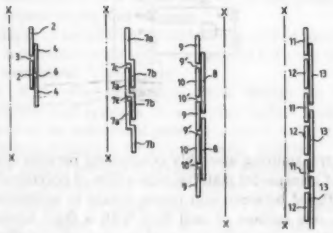
being composed of GRIN lens disks which are stacked on said end face.

4,521,072

OPTICAL CABLE DESIGNED TO WITHSTAND HIGH PRESSURES

Henri E. Cholley, Lamorlaye; Jean J. Laupretre, Rochy Conde, and Jean Rollet, Paris, all of France, assignors to Foptica, Sainte Genevieve, France

Filed Jun. 28, 1982, Ser. No. 392,685
Claims priority, application France, Aug. 5, 1981, 81 15218
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.23 13 Claims



1. A flexible optical transmission cable adapted for operation under pressure, the cable being made up of at least one elementary cable comprising optical fibers disposed in a circular cylindrical support and surrounded by at least one wound strip having a space between adjacent strip edges in a wound strip layer, and providing more than 100% overlap of said wound strip layer to cover the space between said adjacent strip edges in said wound layer, the strip being in turn surrounded by a sealing-tight sheath and the elementary cable or cables being in turn surrounded by bearing means and mechanical protection means wherein the thickness of the wound strip or strips is related to the winding radius at a given critical pressure or buckling pressure (Pc) by the following formula:

$$Pc = \frac{E}{4(1-\mu^2)}\left(\frac{e}{R}\right)^3$$

in which:

E=elasticity modulus of the strip material,

μ=Poisson coefficient of the strip material,

3=width of strip and

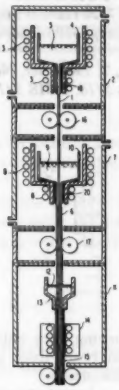
R=average radius around which the outermost strip is wound.

4,521,073

INFRARED LIGHT TRANSMITTING FIBER AND PROCESS FOR PRODUCING THE SAME

Kazuhito Murakami, and Kenichi Takahashi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 12, 1982, Ser. No. 338,941
Claims priority, application Japan, Jan. 12, 1981, 56-2146
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.34 13 Claims



1. An infrared light transmitting optical fiber having a protective coating formed in intimate contact around a step-index fiber having a core and a cladding wherein the core is an infrared light transmitting crystalline material and the cladding is an infrared light transmitting crystalline material,

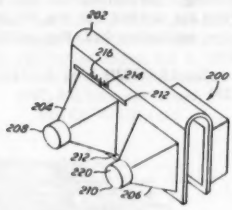
wherein the core material has a higher melting point and a higher refractive index than the cladding material.

4,521,074

BINOCULAR PRESENTATION OF VISUAL INFORMATION

Patrick G. Kalaugher, Exmouth, England, assignor to University of Exeter, Devon, United Kingdom

Filed Jan. 13, 1983, Ser. No. 457,515
Claims priority, application United Kingdom, Jan. 22, 1982, 8201842
Int. Cl.³ G02B 27/02
U.S. Cl. 350—145 7 Claims



1. A method for presenting first and second images derived from respective different sources to respective ones of an observer's eyes so that they can be substantially mentally fused to be perceived as a single mental image, wherein the method comprises: prerecording a first image to serve as a first image source; selecting a second, different image source for a second image so that said first and second images have substantial but not complete equivalence in visual content; presenting said first image to the observer's first eye while simultaneously

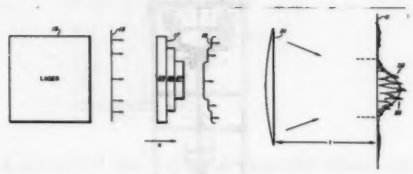
presenting to the observer's second eye said second image under conditions such that it matches the first image sufficiently for said substantial mental fusion to occur; and subsequently interrupting the presentation of one of said images to a respective eye, the other image being visible to the other eye during said interruption; said interruption being effected externally of the observer.

4,521,075

CONTROLLABLE SPATIAL INCOHERENCE ECHELON FOR LASER

Stephen P. Obenschain, 7520 Hamlet St., Springfield, Va. 22151, and Robert H. Lehmberg, 4502 Hadrian Ct., Alexandria, Va. 22310

Filed Mar. 7, 1983, Ser. No. 472,690
Int. Cl.³ G02B *5/18*; H01S *3/13*; G21B *1/00*
U.S. Cl. 350—162.11 **18 Claims**



1. A system for achieving very uniform illumination of a target by a nonuniform beam from a broadband spatially-coherent light source comprising:

a broadband spatially-coherent source of a nonuniform light beam, the beam being characterized by a coherence time that equals the reciprocal of its spectral bandwidth;

a stack of transparent plates packed together to form a stairway of steps for breaking up the beam into a plurality of differently-delayed beamlets with delay increments longer than the coherence time of the beam, said steps having unequal risers and disposed so that the base of the stairway lies in a plane normal to the beam direction; and

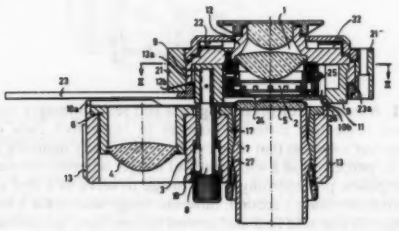
focusing means for overlapping the beamlets at the target to produce, on time scales long compared to the coherence time of the beam, a smooth diffraction profile which is relatively insensitive to amplitude and phase nonuniformities in the beam provided that the beam is uniform over the areas of the individual beamlets.

4,521,076

TRANSMITTED-LIGHT ILLUMINATING DEVICE

Klaüs Weber; Manfred Willert, both of Königsbronn, and Heinz Biessmann, Rosdorf, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,207
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1982, 3225479
Int. Cl.³ G02B *7/00, 21/14*
U.S. Cl. 350—254 **9 Claims**



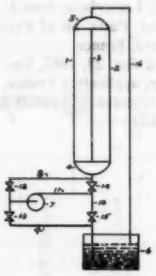
1. A transmitted-light illuminating device having a condenser (1) and an iris-aperture diaphragm (2) on an optical axis, and a turret (3) for the indexed switching-in of auxiliary lenses (4) and/or diaphragms (5), the turret (3) being coupled with the iris-aperture diaphragm (2), characterized by the fact that the turret (3) has at least three receiving openings adapted for optional provision of a ring-diaphragm (5) inserts (7) and/or auxiliary-lens (4) inserts (6) and is mounted for indexed rotation about an index shaft (8), said index shaft (8) being carried at a fixed eccentric location on a ring (9) which controls the opening of the iris diaphragm and which is rotatable about the optical axis, and detent means coacting between the turret (3) and the ring (9) to provide detent retention of each index position at which one of the receiving openings is centered on the optical axis.

4,521,077

LIGHT TRANSMITTING WINDOW ASSEMBLY

Dale L. Connelly, Forth Worth, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Filed Aug. 16, 1983, Ser. No. 523,559
Int. Cl.³ G02B *5/00, 5/02, 5/24*
U.S. Cl. 350—319 **5 Claims**



1. A light transmitting assembly comprising parallel spaced apart panes of transparent material with a film of polytetrafluoroethylene affixed between said panes, means to substantially coat at least one surface of said film with a fluid having a refractive index approximately equal to that of said film to render said film transparent and means to remove said fluid.

4,521,078

ELECTRO-OPTICAL DISPLAY WITHOUT REFLECTION

Holm Baeger, Schwalbach, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,546
Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019311
Int. Cl.³ G02F *1/13*
U.S. Cl. 350—334 **11 Claims**

1. In an electro-optical display on an instrument panel of an automotive vehicle, said display including a liquid crystal layer and a polarization filter, said display for displaying characters and symbols in said liquid crystal layer the improvement wherein

a depth of installation of said device on said instrument panel is commensurate with the distance between said filter and said layer; and

means for swingably mounting said display on said instrument panel are provided so that a central plane through the characters and symbols of the liquid crystal layer is selectively arrangeable in positions other than 90 degrees relative to a direction in which the observer sitting nor-

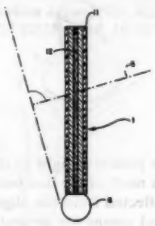
mally in the vehicle views the liquid crystal display and the configuration of the characters and symbols appearing in the liquid crystal layer is a projection of characters and symbols which is perceivable by the observer from a plane vertical to said direction of view of the observer to said plane of the liquid crystal layer.

10. In an electro-optical display for displaying characters and symbols in a liquid crystal layer of the display on an instrument panel of an automotive vehicle, the improvement wherein

the layer of said display is curved and is variably arrangeable in a position other than 90 degrees relative to a direction in which an observer sitting normally in the vehicle views the liquid crystal display;

said display comprising said liquid crystal layer and a polarization filter curved as said to maintain a spacing between said layer and said filter; and wherein

the characters and symbols appearing in the liquid crystal layer are a projection of characters and symbols which are



perceivable by the observer from a plane vertical to said direction of view of the observer to said plane of the liquid crystal layer; and wherein

a depth of installation of said device on said instrument panel is commensurate with the distance between said filter and said liquid crystal layer.

11. A dereflected electro-optical display for representing characters and symbols on a display surface thereof facing a viewer on an instrument panel of a motor vehicle having windows and defining a longitudinal axis, wherein

said display surface is arranged in a position wherein a central perpendicular to the display surface is downwardly inclined at an angle relatively to the longitudinal axis of the vehicle, and light arriving from the windows and reflected at the display surface is reflected into a region which is situated below viewing direction of the viewer viewing the display, and

means for pivotally coupling said display to said instrument panel are provided so that said angle is selectively variable.

4,521,079

LOW-REFLECTION LIQUID-CRYSTAL DISPLAY

Frans Leenbouts, Lenzburg, Switzerland, and Hans Krüger, Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 416,059

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1981, 3137518

Int. Cl.³ G02F *1/135;* G02B *5/28*

U.S. Cl. 350—339 R **9 Claims**

1. A liquid-crystal display with

(1) two mutually parallel, spaced-apart support plates which

(2) enclose between them a liquid-crystal layer which can be switched between two optically different states, and

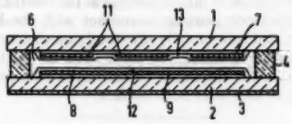
(3) carry, on the surfaces of the two plates facing each other, electrically conductive coatings as electrodes, with at least one of the two support plates designated to be a first support plate

(4) carrying several separately addressable electrodes, and

(5) a continuous dielectric layer designated to be a matching layer under the electrodes, and

(6) a first layer system disposed on top of the electrodes which system contains at least one continuous dielectric layer and a topmost layer designated to be an orientation layer which aligns the liquid-crystal layer,

the combination therewith wherein at least in the first support plate



(7) the matching layer rests on a substrate, and the refraction index n_u of the latter is smaller than the refraction index n_e of the electrode,

(8) the matching layer has an index of refraction n_a, which has at least approximately, the following relationship to the refraction indices of the electrode and substrate:

$$n_a = \sqrt{n_u \cdot n_e} ,$$

and wherein n_a is between 1.65 and 1.75,

(9) the matching layer has a thickness d_a, according to

$$\left(\frac{2m - 1\lambda}{4n_a} - 12\right) \text{ nm} \leqq d_a \leqq \left(\frac{2m - 1\lambda}{4n_a} + 12\right)$$

($\lambda = 550$ nm, m = natural integer > 0), and nm is nanometer,

(10) the layers of the first layer system have indices of refraction between 1.60 and 1.70 and a total thickness between 20 nm and 70 nm

(11) the first layer system rests on another layer system which consists of a single continuous dielectric layer, and

(12) the protective layer of said another layer system has a refraction index between 1.40 and 1.50 and a total thickness which is in the range between 20 nm and 50 nm.

4,521,080

FIELD EFFECT MODE LIQUID CRYSTAL DISPLAY

Fumiaki Funada, Tenri, and Keiichiro Shimizu, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

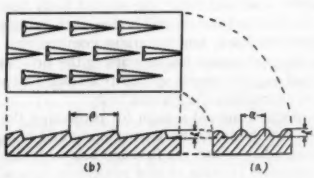
Continuation of Ser. No. 925,783, Jul. 18, 1978, abandoned, which is a continuation of Ser. No. 592,225, Jul. 1, 1975, Pat. No. 4,232,947. This application Oct. 18, 1982, Ser. No. 432,660

Claims priority, application Japan, Jul. 1, 1974, 49-75689

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—341 **4 Claims**



1. A liquid crystal display cell including a layer of liquid crystal material sandwiched between a pair of opposing paral-

lel plates each carrying an electrode coating, said liquid crystal display cell further comprising:

a first micro groove structure consisting of a multiplicity of grooves provided at the interfacial surface of the electrode coating in contact with the liquid crystal layer for defining the direction of the liquid crystal molecules in the liquid crystal layer in the plane of said interfacial surface; and

a second micro groove structure of a multiplicity of substantially saw-tooth micro grooves at the interfacial surface of the electrode coating in contact with the liquid crystal layer, said substantially saw-tooth micro grooves having a profile for defining the inclination of the liquid crystal molecules in the liquid crystal layer with respect to said plane of said interfacial surface.

4,521,081

ELECTROCHROMIC DISPLAY DEVICE

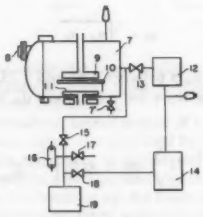
Kiyoshi Miyake, Ube, and Hiroko Kaneko, Toyoura, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Mar. 25, 1982, Ser. No. 361,874

Claims priority, application Japan, Mar. 30, 1981, 56-45594; Mar. 30, 1981, 56-45595

Int. Cl.³ G02F 1/17

U.S. Cl. 350—357 **15 Claims**



1. A process for forming an electrochromic film comprising the steps of: introducing a mixture of oxygen gas and inert gas at a predetermined mixing ratio into a reactor which includes one electrode to which a tungsten sheet is fixed as a target and a counter-electrode holding a substrate; maintaining a predetermined total pressure condition and applying a predetermined voltage between said electrodes while maintaining said substrate at a predetermined temperature, thereby forming a WO_x-sputtered film on said substrate.

4,521,082

EXPOSURE APPARATUS

Akiyoshi Suzuki; Hirosi Sato, both of Tokyo; Takashi Omata, Yokosuka, and Masao Kosugi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,895

Claims priority, application Japan, Aug. 8, 1981, 56-124211

Int. Cl.³ G02F 1/01

U.S. Cl. 350—405 **11 Claims**

1. An exposure apparatus for projecting a pattern from a first body onto a second body, the second body being photosensitive, the first and the second bodies each being provided with an alignment mark, said apparatus comprising:

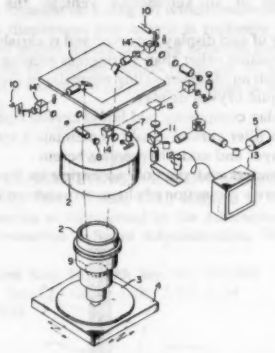
first support means for supporting the first body;

second support means spaced from said first support means for supporting the second body;

a projection optical system for projecting the pattern from the first body to the second body and being so arranged that, when in use, the first and second bodies are optically conjugate relative to said projection optical system;

illuminating means for illuminating the first body so that the pattern may be projected by said projection optical system onto the second body; and

alignment means for aligning the first and the second bodies, said alignment means comprising a source of polarized light, an alignment optical system for projecting said polarized light onto the first body and through said projection optical system onto the second body for illuminating the alignment marks on the first and the second bodies, phase converting means positioned in the optical path between the first and second bodies for altering the polarization of the polarized light so that light reflected from the alignment mark of the first body may be distinguished from light reflected from the alignment mark of the second body, and means for separating the polarized light reflected from the respective alignment marks to permit alignment to be performed, said phase converting means being mounted to remain in position during the projection of the pattern from the first body to the second body.



4,521,083

MICROSCOPE OBJECTIVE

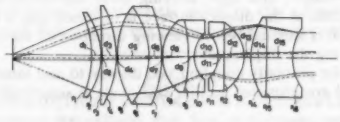
Takayoshi Togino, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1983, Ser. No. 553,296

Claims priority, application Japan, Nov. 26, 1982, 57-206204

Int. Cl.³ G02B 9/62, 21/02

U.S. Cl. 350—414 **5 Claims**



1. A microscope objective comprising a first, second, third, fourth, fifth and sixth lens components wherein said first lens component is a positive lens, said second lens component is a positive lens, said third lens component is a positive cemented lens, said fourth lens component is a cemented meniscus lens arranged to be convex toward the object side, said fifth lens component is a cemented meniscus lens arranged to be concave toward the object side, and said sixth lens component is a cemented meniscus lens, said microscope objective being arranged to fulfill the following conditions:

(1) $2.5f < |r_1/(n_1-1)| < 3.5f$, $r_1 < 0$

(2) $0.45f < r_{10} < 0.55f$

(3) $0.45f < r_{11} < 0.65f$, $r_{11} < 0$

(4) ν_5, $\nu_8 \geqq 65$

(5) $10f < |f_{56}| < 50f$

(6) $n_9 - n_{10} \geqq 0.18$

where, reference symbol f represents the focal length of the lens system as a whole, reference symbol f_{56} represents the total focal length of the fifth and sixth lens components, refer-

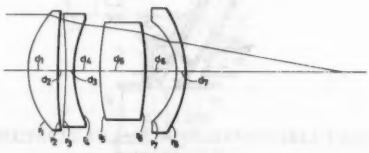
ence symbol r_1 represents the radius of curvature of the surface on the object side of the first lens component, reference symbol r_{10} represents the radius of curvature of the surface on the image side of the fourth lens component, reference symbol r_{11} represents the radius of curvature of the surface on the object side of the fifth lens component, reference symbol n_1 represents the refractive index of the first lens component, reference symbols n_9 and n_{10} respectively represent refractive indices of respective lens elements constituting the sixth lens component, reference symbol ν_5 represents Abbe's number of the lens element on the object side in the fourth lens component, and reference symbol ν_8 represents Abbe's number of the lens element on the image side in the fifth lens component.

4,521,084

PHOTOGRAPHIC LENS SYSTEM

Takashi Kurihara, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1983, Ser. No. 545,776
Claims priority, application Japan, Nov. 12, 1982, 57/197542
Int. Cl.³ G02B *9/34, 13/18*
U.S. Cl. 350—432 **7 Claims**



1. A photographic lens system with a short overall length comprising a first, second, third and fourth lens components wherein said first lens component is a positive meniscus lens arranged to be convex toward the object side, said second lens component is a biconcave lens, said third lens component is a biconvex lens and said fourth lens component is a negative meniscus lens arranged to be concave toward the object side, the surface on the object side of said second lens component being arranged as an aspherical surface, said photographic lens system fulfilling the conditions (1) through (4) shown below:

(1) $-0.58<f(n_2'1)/r_3<-0.16$

(2) $4.5\times10^{-4}<|\Delta x/f|<2.0\times10^{-3}$

(3) $\nu_1-\nu_2>19.0$

(4) $0.11f<d_5<0.16f$

where, reference symbol f represents the focal length of the lens system as a whole, reference symbol r_3 represents the radius of curvature of reference surface for the aspherical surface on the object side of the second lens component, reference symbol d_5 represents the thickness of the third lens component, reference symbol n_2 represents the refractive index of the second lens component, reference symbols ν_1 and ν_2 respectively represent Abbe's numbers of the first and second lens components, and reference symbol Δx represents the amount of deviation of the aspherical surface on the object side of the second lens component from said reference surface which is measured in the x direction at the position of the maximum effective diameter.

4,521,085

CONICAL MIDDLE COMPONENT MICROSCOPIC LENSES

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

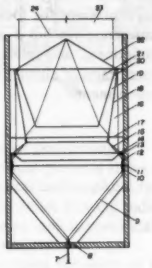
Filed Jul. 17, 1984, Ser. No. 631,738
Int. Cl.³ G02B *13/18, 21/00*
U.S. Cl. 350—432 **1 Claim**

1. Two conical middle component microscopic lenses RT (1, 2) for mounting between lower and middle component lenses RR (3, 4), forming a five-component microscopic stage lens mounted inside a tubular casing (6) and aligned on a common vertical optic axis so as to produce single and multiple magnification of images and single and multiple concentration of beams, with the following component lenses;

a. Lower component lens RR (3) with a concave conical section (8) which refracts incipient beam (7), forming divergent conical beam (9), and with convex conical section (10) which refracts beam (9), forming annular beam (11),

b. First middle component lens RT (1) with a convex conical section (12) which refracts beam (11), forming convergent conical beam (13), and with concave conical section (14) which emits beam (13),

c. Second middle component lens RT (2) with a concave



conical section (15) which refracts beam (13), forming annular beam (16), and with a planar section (17) which emits beam (16),

d. Third middle component lens RR (4A) with a convex conical section (18) which refracts beam (16), forming convergent conical beam (19), and with concave conical section (20) which refracts beam (19), forming convergent conical beam (21),

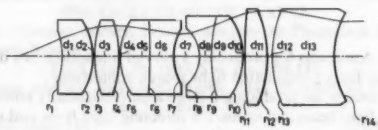
e. Upper component lens RT (5) with a concave conical section (22) which refracts beam (21), forming circular enlarged whole beam (23), and with planar section (24) which emits beam (23) parallel to the vertical optic axis of the lenses.

4,521,086

OBJECTIVE FOR AN IC MASK TESTING DEVICE

Hiroyuki Kurita, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,798
Claims priority, application Japan, Jul. 14, 1982, 57-121346
Int. Cl.³ G02B *21/02, 9/62*
U.S. Cl. 350—464 **6 Claims**



1. An objective for an IC mask testing device comprising a first, second, third, fourth, fifth and sixth lens components, said first lens component being a positive meniscus lens, said second lens component being a biconvex lens, said third lens component being a cemented doublet consisting of a biconvex lens and a biconcave lens, said fourth lens component being a cemented doublet consisting of a biconcave lens and a biconvex lens, said fifth lens component being a biconvex lens, said sixth lens component being a negative meniscus lens, said objective for an IC mask testing device being arranged to fulfill the conditions (1) through (5) shown below:

(1) $1.2f<f_p<1.8f$

(2) $1.5f<f_1$

(3) $d_1<0.36f$

(4) $1.27f<r_{13}<1.40f$

(5) $1.0f<r_{14}<1.05f$

where, reference symbol f represents the focal length of the lens system as a whole, reference symbol f_p represents the total focal length of the first through the fifth lens components, reference symbol f_1 represents the focal length of the first lens component, and reference symbol d_1 represents the thickness of the first lens component, and reference symbols r_{13} and r_{14} respectively represent radii of curvature of respective surfaces of the sixth lens component.

4,521,087

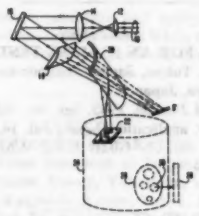
OPTICAL SYSTEM WITH DIFFUSER FOR TRANSFORMATION OF A COLLIMATED BEAM INTO A SELF-LUMINOUS ARC WITH REQUIRED CURVATURE AND NUMERICAL APERTURE

Lawrence P. Hayes, deceased, late of Berlin, Vt.; by Ellen J. Hayes, administratrix, Johnson City, N.Y.; Kantilal Jain, San Jose, and Randall T. Kerth, Morgan Hill, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 23, 1983, Ser. No. 497,392

Int. Cl.³ G02B *27/00*

U.S. Cl. 350—574 **8 Claims**



1. Apparatus for producing a curved line source of a desired shape from a collimated light source comprising

a source for producing a large area substantially collimated light beam and means for directing light from said source along a predetermined path;

first optical means along said predetermined path to direct light toward a virtual line image at a first predetermined location;

second optical means interposed between said first optical means and said first predetermined location to produce an arc shaped beam and to direct said beam to a second location; and

third optical means comprising a diffuser fixed at said second location to receive said arc shaped beam whereby impingement of said beam upon said third optical means produces a continuous self-luminous curved line source of a desired shape.

4,521,088

OPTICAL ELEMENT HAVING A CATALYTIC COATING TO PROMOTE OXIDATION OF OPTICALLY-OPAQUE SUBSTANCES

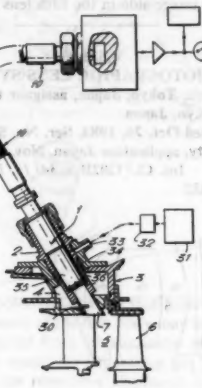
Ronald A. Masom, Bitterne, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Jun. 14, 1983, Ser. No. 504,339

Claims priority, application United Kingdom, Jun. 17, 1982, 8217559

Int. Cl.³ G02B *1/10*

U.S. Cl. 350—582 **3 Claims**



1. Apparatus for viewing a combustion chamber, the apparatus having forward and rear ends; means mounting said apparatus such that said forward end is located in the vicinity of the combustion chamber; an optically-transparent element having forward and rear surfaces; a surface layer exposed on said forward surface of said element, said layer being substantially transparent to radiation of the wavelengths to which said element is exposed and comprising a catalytic material selected to lower the temperature of oxidation of optically-opaque substances contacting the element below the temperature to which said element is exposed, so as to promote conversion of said substances to a gaseous form; and means mounting said optically-transparent element towards said forward end of the apparatus.

4,521,089

OPTICAL WINDOW PURGE ARRANGEMENT

Thomas L. Bohl, Madison, and Richard C. Ciammaichella, Newbury, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 17, 1983, Ser. No. 542,876

Int. Cl.³ G02B *7/00*

U.S. Cl. 350—582 **10 Claims**

1. An apparatus for isolating an optical surface of an optical element, from a contaminating environment, comprising:

an outer tube having one open end communicating with the contaminating environment;

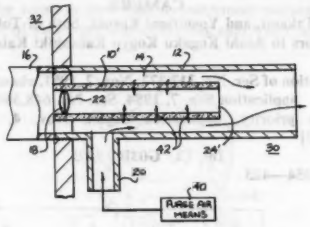
an inner tube having sides and an open end, disposed in said outer tube and defining with said outer tube a purging gas space surrounding said sides and open end of said inner tube;

the optical element associated with said inner tube so that the optical surface thereof is exposed to an inner space of said inner tube with the optical surface spaced from said open end of said inner tube;

purging gas means connected to said outer tube and communicating with said purging gas space for supplying a purging gas to said purging gas space; and

said inner tube being made of material having porosity

within a selected range so that at least some of the purging gas supplied by said purging gas means to said purging gas



space filters into said inner space to prevent aspiration of contaminents from the contaminating environment into said open end of said inner tube.

4,521,090

SPECTACLE FRAME WITH REMOVABLE FACE ASSEMBLY

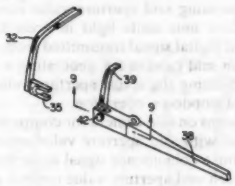
Jean-Claude Pierquin, Dompcevrin, France, assignor to Essilor International (Compagnie Generale d'Optique), Cedex, France

Filed Jul. 15, 1982, Ser. No. 398,568

Claims priority, application France, Aug. 11, 1981, 81 15512; Apr. 16, 1982, 82 06575

Int. Cl.³ G02C *1/04, 5/02, 5/00*

U.S. Cl. 351—124 **21 Claims**



1. A spectacle frame comprising:

two components which constitute a supporting structure and a face assembly, respectively, mounted removably to each other, one of said components comprising at least one locking means and the other component comprising a recess adapted to receive said at least one locking means, said at least one locking means being movable between a rest position wherein it allows said two components to be separated from each other and an active position wherein said at least one locking means cooperates with said recess when said supporting structure and said face assembly are mounted onto each other, so as to firmly connect said supporting structure to said face assembly; and

a spring biasing said at least one locking means toward its active position; and

said at least one locking means is constituted by a teat having a key accessible from the outside of the frame, the arrangement being such that a pressure exerted on said key causes said teat to move toward its rest position against the action of the spring.

4,521,091

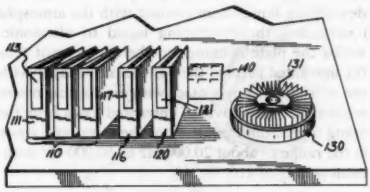
SLIDE PRODUCTION SYSTEM

Gene Theslof, Jr., North Saint Paul, Minn., assignor to Custom Laboratories, Inc., Minneapolis, Minn.

Continuation of Ser. No. 116,840, Jan. 30, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 421,854

Int. Cl.³ G03B *23/08*

U.S. Cl. 353—122 **12 Claims**



1. A slide production kit comprising:

a first library of individual pictorial slides depicting a plurality of different subjects with a plurality of slides for each subject, each of said slides bearing indicia identifying the slide by category and indicia specifically identifying the slide within said category;

first means for categorizing the slides of the first library by subject matter and for housing said slides in a manner which uniquely identifies each slide, said means including album pages constructed and arranged so as to physically separate said slides by category;

a second library including a first plurality of multiple-image slides each of which includes images of the slides in one of the categories of said first library;

second means for housing the slides of the second library, said second means being constructed and arranged to permit selected presentation of said multiple-image slides and review of the subject matter depicted by each;

a third library of individual exemplary slides representative of optical additions and variations, the subject matter of which may be selectively merged with an individual pictorial slide to achieve a desired presentation;

third means for housing the slides of the third library in predetermined categories; and

an index of selected multiple-image positions, cropping sizes and locations;

with said second library further including a second plurality of multiple-image slides each of which includes images of the slides in one of the categories of the third library.

4,521,092

DEVELOPING LIGHT SENSITIVE PLATES INCLUDING USE OF ULTRASONIC WAVES

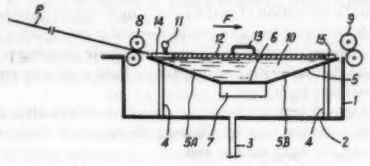
Mario Ferrante, Nancy, France, assignor to Photomeca S.A., Nancy, France

Filed May 19, 1983, Ser. No. 496,110

Claims priority, application France, May 25, 1982, 82 09037

Int. Cl.³ G03D *3/08*

U.S. Cl. 354—320 **5 Claims**



1. A process for developing a relatively rigid plate having

thereon a light sensitive layer, regions of which have been exposed to light so as to alter the characteristic thereof thereby producing wanted and unwanted parts of the light sensitive layer, comprising the steps of:

(a) passing the plate through a bath of developing liquid at a speed in the range of 1 to 4 meters per minute, on a continuous basis, said developing liquid removing the unwanted parts of the light sensitive layer from the plate,

(b) protecting at least the major part of the surface of the developing liquid from contact with the atmosphere,

(c) subjecting the developing liquid to ultrasonic waves whilst the plate is immersed therein to assist removal of the unwanted parts of the light sensitive layer without the use of friction from contact with mechanical means and to encourage the removal of unwanted gases from the developing liquid, the frequency of the ultrasonic waves being in the range of about 20,000 Hz to 50,000 Hz with a minimum power of 100 W.

4,521,093

AUTOMATIC FOCUSING DEVICE USED IN COMBINATION WITH AUXILIARY LIGHT SOURCE

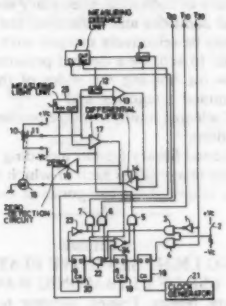
Takashi Kawabata, Kamakura, and Masanori Yamada, Yokosuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,473

Claims priority, application Japan, Jan. 26, 1983, 58-11051

Int. Cl.³ G03B *3/00, 7/00*

U.S. Cl. 354—403 **5 Claims**



1. An automatic focusing device for automatically focusing a photo-taking lens by utilizing an auxiliary light, comprising:

(a) auxiliary light source for emitting the auxiliary light;

(b) drive means for moving said photo-taking lens;

(c) first control means for activating said drive means prior to the activation of said auxiliary light source to move said photo-taking lens to a predetermined position other than a minimum focusing position or an infinite focusing position and then activating said auxiliary light source to emit the auxiliary light;

(d) focus detection circuit for detecting a focus state of said photo-taking lens by utilizing the auxiliary light of said auxiliary light source; and

(e) second control means for activating said lens drive means on the basis of the focus state detected by said focus detection circuit.

4,521,094

APERTURE VALUE CONTROL DEVICE UTILIZING FREQUENCY SIGNAL FROM FLASH UNIT FOR CAMERA

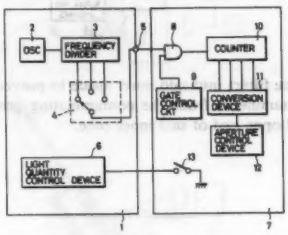
Satoshi Takami, and Yoshifumi Kuroki, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 317,377, Nov. 2, 1981, abandoned. This application Sep. 7, 1984, Ser. No. 648,360

Claims priority, application Japan, Nov. 4, 1980, 55-157743[U]

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—423 **7 Claims**



1. An aperture control system for a camera having a flash unit, said aperture control system being of the type having means for generating an aperture value control signal and an aperture value control device on said camera which controls the aperture of said camera to a value in accordance with the value of said aperture value control signal, said control system comprising:

first means on said flash unit for generating a digital signal representing a desired aperture value in accordance with the flash emission characteristics of said flash unit, and for transmitting said digital signal to said camera;

second means on said camera for receiving said digital signal and for generating said aperture value control signal before said flash unit emits light in accordance with the value of said digital signal transmitted from said flash unit;

third means on said camera for generating a second digital signal representing the actual aperture value of said camera during a stopdown operation;

comparison means on said camera for comparing said second digital signal with said aperture value control signal and for generating a coincidence signal upon detecting coincidence between said aperture value control signal and said second digital signal; and

said aperture control device stopping the adjustment of said aperture in response to said coincidence signal from said comparison means, whereby the aperture of said camera is automatically controlled to said desired value without the necessity of a camera operator manually setting the camera aperture to said desired value.

4,521,095

ELECTROPHOTOGRAPHIC COPYING APPARATUS INCLUDING SPECIFIC TONER FUSING ROLL AND ITS METHOD OF USE

Edward F. Mayer, San Jose, Calif., assignor to Ricoh Company, Ltd., Tokyo, Japan

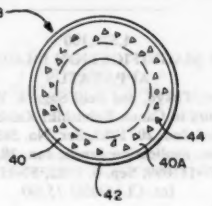
Filed Sep. 2, 1983, Ser. No. 529,122

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 FU **12 Claims**

1. In an electrophotographic copying apparatus in which heat fusible toner is transferred from its photoconductive drum to one surface of the ultimate copy sheet, an assembly for fusing the transferred toner onto said sheet, said assembly comprising means supporting said copy sheet for movement along a given path, a fusing roll having an outermost circum-

ferential surface, and containing inwardly of said outermost surface a material which undergoes a phase change at approximately the fusing temperature of said toner, means supporting said roll for rotation such that its outermost surface engages the surface of said copy sheet carrying said toner, and means



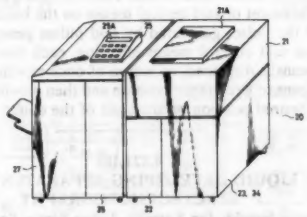
for heating said roll to at least said fusing temperature in order to cause said material to undergo an endothermic phase change and thereby serve as a means for storing heat for use in fusing said toner as the outermost surface of said roll engages said copy sheet.

4,521,096

APPARATUS FOR COMBINING INFORMATION FROM DIFFERENT FORMS TO GENERATE COMPOSITE SLIPS

Saburo Suganuma, and Hiroyuki Kataoka, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1982, Ser. No. 403,191
Claims priority, application Japan, Jul. 30, 1981, 56-118471
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **6 Claims**



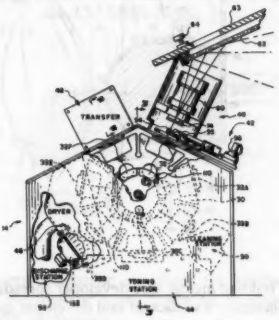
1. A slip processing apparatus, comprising:
form memory means for storing a slip form as an image;
data reading means for reading data necessary for processing a slip;
data memory means for storing as an image, data read by said data reading means;
editing means for distributing predetermined data stored in said data memory means to at least one predetermined position on said form which is stored by said data memory means; and
printer means for printing out on a sheet data distributed by said editing means;
wherein said data memory means comprises first and second memory regions, said first memory region storing unedited data to be distributed and printed out on said sheet, and said second memory region stores data distributed by said editing means, and wherein said printing means prints out on said sheet data from said second memory region.

4,521,097

ELECTROPHOTOGRAPHIC IMAGE RECORDING METHOD AND APPARATUS

Manfred R. Kuehnle, New London, N.H.; George J. Perry, and Robert M. Rose, both of Sudbury, Mass., assignors to Coulter Systems Corporation, Bedford, Mass.

Filed Sep. 24, 1982, Ser. No. 423,020
Int. Cl.³ G03G *15/22*
U.S. Cl. 355—3 R **36 Claims**



1. A method of producing an image-carrying receptor of an original image comprising:
i. providing a planar electrophotographic member having an outwardly facing photoconductive surface,
ii. applying a substantially uniform charge to the photoconductive surface;
iii. projecting a light pattern representative of the original image for a predetermined time, thereby forming a latent electrostatic image on said charged photoconductive surface;
iv. applying toner to the latent electrostatic image, thereby rendering the same visible;
v. drying said photoconductive surface;
vi. transferring the toner image to a transfer medium by:
(a) providing a transfer medium consisting of a substrate carrying a thin heat softenable resin overcoat layer bonded thereto;
(b) bringing together the photoconductive surface of the electrophotographic member carrying the dry toner image and the overcoat layer of the transfer medium in contact engagement;
(c) applying heat and pressure to the engaged layer and surface softening said layer, thereby embedding the toner image within the overcoat layer;
(d) releasing the engaged transfer medium from the photoconductive surface; and
vii. readying the photoconductive surface for reuse after the transfer is completed.

4,521,098

DEVELOPING DEVICE

Masahiro Hosoya, Yokohama, and Tsuyoshi Ueno, Fujisawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

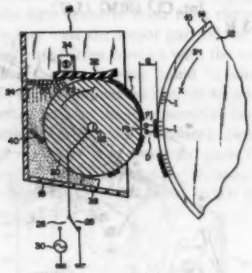
Division of Ser. No. 363,933, Mar. 31, 1982, Pat. No. 4,498,756.
This application Oct. 31, 1983, Ser. No. 547,321
Claims priority, application Japan, Apr. 7, 1981, 56-51048
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—3 DD **4 Claims**

1. A device for developing a latent image formed on a latent image forming surface, by making a non-magnetic single-component developer attracted to the latent image, comprising:
developer holding means for holding said developer on the surface thereof and transferring said developer to a posi-

tion which is in opposition to said latent image forming surface;

supply means for supplying the developer to said developer holding means; and

developer spreading means for spreading the developer supplied by said supply means on the surface of said developer holding means, said developer spreading means having elasticity, a surface of said developer spreading means being pressed, except for the end portions thereof, against the surface of said developer holding means with a predetermined nip width, whereby a developer layer is formed on the surface of said developer holding means.



4,521,099

COPYING APPARATUS

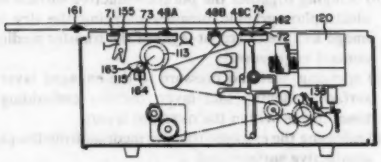
Hajime Katayama; Hiroshi Nitanda; Tateki Nagaoka, all of Tokyo; Hirotoshi Kishi, Higashimurayama; Yusaku Takada, Tokyo; Noriyoshi Iida, Ichikawa; Tsuneki Inuzuka, Fuchu, and Yutaka Komiya, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 932,655, Aug. 10, 1978, abandoned, which is a division of Ser. No. 624,118, Oct. 20, 1975, Pat. No. 4,139,300. This application Sep. 22, 1981, Ser. No. 304,565

Claims priority, application Japan, Oct. 22, 1974, 49-127795[U]; Dec. 13, 1974, 49-143891

Int. Cl.³ G03G *15/04*

U.S. Cl. 355—8 **8 Claims**



1. An image forming apparatus comprising:

process means for forming an image on a recording material, said process means including reciprocable means for scanning an original document;

detecting means for detecting a start position of said reciprocable means to start the reciprocation of said reciprocable means for scanning from the start position;

setting means, in response to said detecting means, for setting before the start of the reciprocation, said reciprocable means to the start position if it is not at the start position;

digital counting means for counting a predetermined period of time required for preliminary operation before image formation but after said process means is instructed to start; and

starting means for starting the scanning operation of said reciprocable means in response to a signal from said detecting means representing said start position, and for outputting a latch signal during the time of operation for the scanning operation of said reciprocable means in response to completion of the counting of the predetermined time period by said counting means, wherein said reciprocable means is kept at said start position in accordance with said setting means during said preliminary operation for image formation.

4,521,100

VARIABLE MAGNIFICATION IMAGE FORMING APPARATUS

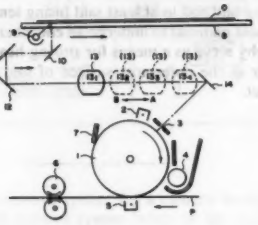
Takaji Yonemori, Tokyo, and Seiji Sagara, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 505,962

Claims priority, application Japan, Jun. 28, 1982, 57-111097; Jun. 28, 1982, 57-111099; Sep. 8, 1982, 57-157162

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—8 **20 Claims**



1. Image forming apparatus wherein an image of an original is formed on a photosensitive member surface at a variable magnification, comprising:

optical means for imaging an original on the photosensitive member surface, said optical means being displaceable to change the magnification at which the image of the original is formed on the photosensitive member surface;

pulse generating means for generating a series of pulses; and

control means for controlling a position of said optical means, said control means controlling the amount of displacement of said optical means on the basis of the count of the pulses generated by said pulses generating means, and said control means effecting, each time said optical means is displaced, an action of once moving said optical means to a reference position and then moving the same to a desired position on the basis of the count.

4,521,101

LIQUID DEVELOPING APPARATUS FOR ELECTROPHOTOGRAPHY

Shigeyoshi Suzuki; Jun Yamada; Takao Senga; Sadao Kuriu, all of Nagaokakyo; Masahiro Yamasaki, Otsu; Iwao Hirose, Hikone, and Tokubee Maegawa, Shiga, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo and Dainippon Screen Mfg. Co., Ltd., Kyoto, both of, Japan

Filed Jun. 13, 1983, Ser. No. 503,602

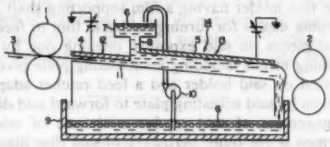
Claims priority, application Japan, Jun. 18, 1982, 57-91211[U]; Jun. 18, 1982, 57-91212[U]; Jun. 18, 1982, 57-91213[U]; Jun. 18, 1982, 57-91214[U]

Int. Cl.³ G03G *15/10*

U.S. Cl. 355—10 **10 Claims**

1. A liquid developing apparatus for electrophotography in which an electrostatic latent image surface of a photoconductive material is placed opposite developing electrodes and, at the same time, is transferred through a liquid toner, said apparatus comprising a developing chamber including means defining a transfer path for the photoconductive material, said means defining said path including a bottom plate having an upstream and a downstream side with respect to a direction of flow of the liquid toner, said path further including developing electrodes which face said bottom plate at predetermined

intervals and including top plates and side plates wherein said developing chamber is divided into a front section and a rear section with respect to the photoconductive material path, said path having a width between the developing electrode in the front section of said chamber and the electrostatic latent image surface of said photoconductive material, said width being



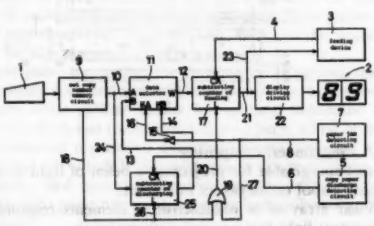
smaller than the width between the developing electrode in the rear section of said developing chamber and the electrostatic latent image surface of said material, said path having opposite end faces on the upstream and downstream sides thereof which are open and at least one supply passage being provided for the liquid toner, said supply passage being located between the front and rear sections of said developing chamber.

4,521,102

COPY PAPER COUNTING METHOD AND DEVICE FOR COPYING APPARATUS

Minoru Motomura, Nara; Kiyoshi Shibata, Osaka; Toshio Watanabe, Osaka, and Yousuke Ohata, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Aug. 27, 1980, Ser. No. 181,842
Claims priority, application Japan, Sep. 3, 1979, 54-113213
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 CU **12 Claims**



1. A method of counting copy papers to be used for a copying apparatus capable of successively reproducing a plurality of copies corresponding to an original document, comprising the steps of:

detecting a copy paper being fed to perform a copying operation, and counting the copy paper by means of a first counter;

terminating the feed of the copy paper when the counting value stored in the first counter becomes equal to a preset number;

detecting a copy paper being discharged after completion of a copying operation, and counting the discharged copy paper by means of a second counter; and

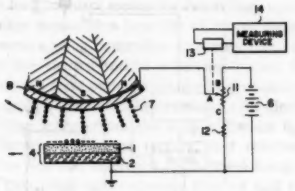
detecting paper jamming, and resetting the counting value of the first counter so as to be equal to the counting value of the second counter in response thereto.

4,521,103

ELECTROPHOTOGRAPHIC REVERSAL DEVELOPING APPARATUS WITH CONTROL OF DEVELOPING ELECTRODE BIAS POTENTIAL

Shuichi Ohtsuka; Yasuo Aotsuka, both of Kasei, and Eiichi Saito, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Dec. 2, 1982, Ser. No. 446,274
Claims priority, application Japan, Dec. 7, 1981, 56-196626
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 D **6 Claims**



1. An electrophotographic apparatus for producing and developing an electrostatic latent image on an electrophotosensitive material, comprising

charging means for applying an electrostatic saturation charging voltage of predetermined polarity to an electrophotosensitive material to produce an electrostatically charged and electrophotosensitive material;

means for exposing said electrostatically charged electrophotosensitive material to an image to be reproduced to form a corresponding electrostatic latent image thereon; and

developing means for developing said electrostatic latent image to a reversal electrophotographic image, said developing means comprising:

supply means for supplying a one-component magnetic toner;

bias means for applying a bias voltage of the same polarity as said electrostatic saturation charging voltage to said one-component magnetic toner, said bias voltage and said electrostatically charged electrophotosensitive material having a predetermined differential;

magnetic brush means for applying said one-component magnetic toner to said electrophotosensitive material having said electrostatic latent image thereon;

means for determining the environmental conditions in which said electrophotosensitive material is placed and supplying a signal representing the so determined environmental conditions; and

control means, responsive to said signal, for changing the voltage differential between said bias voltage and said electrostatically charged electrophotosensitive material by setting said bias voltage to a value appropriate for preventing appearance of fog in a reversal electrophotographic image and assuring good contrast therein.

4,521,104

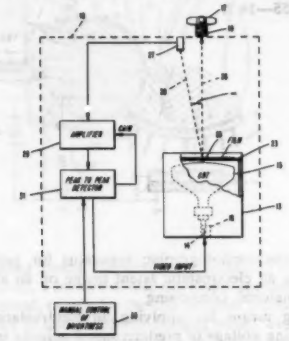
APPARATUS AND METHOD FOR PRODUCING PHOTOGRAPHIC RECORDS OF TRANSPARENCIES

Dwin R. Craig, 9447 Emory Grove Rd., Gaithersburg, Md. 20877

Filed Nov. 29, 1983, Ser. No. 555,973
Int. Cl.³ G03B *27/72, 27/80*
U.S. Cl. 355—20 **11 Claims**

1. Apparatus for producing photographic prints of transparency images comprising a standard television monitor including a cathode ray tube having a raster and operable to generate a flying spot of light on the raster at a standard television sweep rate, a camera having a lens positioned to view the raster, means for supporting said transparency between said raster and said camera lens whereby said lens views light from

said flying spot passing through said transparency, a photoelectric detector operable to continuously monitor light from said flying spot passing through said transparency, said photoelectric detector being positioned relative to said lens to monitor light passing through each area of said transparency before light passing through the same areas of said transparency is viewed by said camera lens, inverse electronic feedback means interconnecting said photoelectric detector and said cathode ray tube and operable to vary the intensity of said light spot



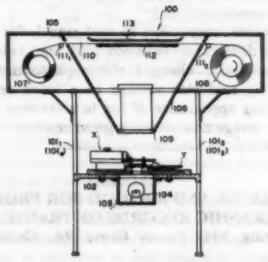
inversely to the brightness of light monitored by said photoelectric detector, said camera lens and said photoelectric detector being positioned relative to one another, and said feedback means being constructed to produce a negative luminous image of said transparency image on said raster, said transparency image and said negative luminous image producing a composite image having a compressed brightness range relative to the brightness range of said transparency image and operable for viewing by the camera lens.

4,521,105

NEGATIVE FILM CARRIER FOR A DISC FILM

Toshiyuki Mukae, and Yoshifumi Azuma, both of Wakayama, Japan, assignors to Noritsu Kenkyu Center Co., Ltd., Wakayama, Japan

Filed Jun. 13, 1983, Ser. No. 503,535
Claims priority, application Japan, Jun. 14, 1982, 57-87321[U]
Int. Cl.³ G03B *27/32, 27/52*
U.S. Cl. 355—64 **6 Claims**



1. A negative film carrier for a disc film having notches at its outer periphery for defining a boundary between adjacent film pieces, said carrier to be used by mounting it on a handling board of a photographic printer, said carrier comprising:

a negative film mask plate adapted to be removably mounted on said handling board, said negative film mask plate having a holding recess on the upper surface thereof and an exposure opening formed within said recess and adapted to overlap with a light projecting aperture formed in said handling board;

a negative film mask holder detachably fitted into said holding recess in a manner immovable in a horizontal direction, said negative film mask holder having a pivoting pin erected thereupon and an exposure opening intercommunicated with said exposure opening of said negative film mask plate;

a disc film holder having a film supporting shaft and a film turning means for turning said disc film to feed negative film pieces on said exposure opening one by one, said turning means including an actuating plate pivotally supported on said holder and a feed ratchet adapted to be driven by said actuating plate to forward said disc film by engagement of said ratchet with one of said notches formed at the outer periphery of said disc film, said disc film holder being supported by said pivoting pin on said negative film mask holder so as to be rotatable about said pivoting pin between one position overlaid on said negative film mask holder to be adapted for printing and another position being displaced to be protruded sidewardly of said negative film mask holder for facilitating the mounting and unloading of said disc film on said shaft; and

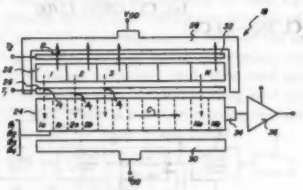
a negative film retainer holder pivotally supported by a horizontal shaft mounted on said negative film mask plate, said negative film retainer holder having a mask-shaped retainer and being adapted for rocking motion about said shaft to allow said retainer to be moved against and away from said disc film.

4,521,106

IMAGE SENSOR AND RANGEFINDER DEVICE WITH BACKGROUND SUBTRACTION USING INTERLACED ANALOG SHIFT REGISTER

David N. Lambeth, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1982, Ser. No. 409,259
Int. Cl.³ G01C *3/10*; G03B *7/08*
U.S. Cl. 356—1 **8 Claims**



1. A rangefinder, comprising:

means energizable for projecting a beam of light to illuminate a spot on an object in a scene;

a linear array of N photosensitive elements responsive to incident light for generating photosignals;

means for forming an image of a portion of the scene containing the illuminated spot on said array;

analog shift register means having 2N cells for receiving, in parallel, N analog signals into N alternate cells, and responsive to clock signals for shifting said analog signals serially toward an output location;

first transfer means responsive to a control signal for transferring N photosignals generated by said array into the N alternate cells of said analog shift register;

control means for (1) energizing said light beam and generating photosignals in said array, (2) sending a control signal to said first transfer means to transfer photosignals into said analog shift register means from said array, (3) deenergizing said light beam and generating photosignals in said array, (4) supplying clock signals to said analog shift register means to shift said photosignals by one cell, (5) sending a control signal to said first transfer means to

transfer photosignals into said analog shift register means, and (6) supplying clock signals to said analog shift register means to shift the photosignals therein serially to the output location; and

signal processing means, including means for (1) receiving said photosignals and forming a series of difference signals representative of the difference between the responses of Nth photosensitive element with the light beam energized and with the light beam deenergized, and (2) detecting the location of the image of said illuminated spot based on the magnitude of said difference signals, and forming a range signal based on the detected location of said illuminated spot.

4,521,107

APPARATUS FOR MEASURING DISTANCES BY MEASURING TIME OF TRAVEL OF A MEASURING LIGHT PULSE

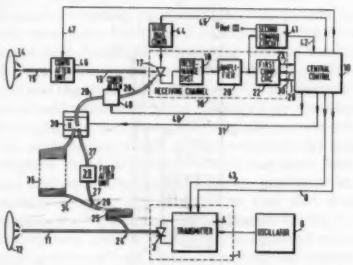
Hoiko Chaborski, Munich, and Walter Mehnert, Ottobrunn, both of Fed. Rep. of Germany, assignors to MITEC Moderne Industrietechnik GmbH, Ottobrunn, Fed. Rep. of Germany

Continuation of Ser. No. 339,785, Jan. 15, 1982, abandoned. This application Sep. 26, 1984, Ser. No. 654,807

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1981, 3103567

Int. Cl.[3] **G01C** *3/08;* **G01S** *13/10*

U.S. Cl. 356—5 **29 Claims**



1. Distance measuring apparatus for measuring the time of travel of individual unmodulated measuring light pulses to a target and therefrom, by reflection, back to the apparatus which for this purpose comprises:

a light pulse transmitter for emitting on triggering thereof individual unmodulated light pulses of short duration,

a light beam splitter means for splitting individual light pulses from said transmitter into two parts, a first of which is directed toward an optical transmitting means and a second of which is directed into a reference light path means, said optical transmitting means transmitting said first light pulse part as a measuring light pulse toward said target,

an optical receiving means for receiving a reflected measuring light pulse from the target,

a receiving channel comprising an electro-optical receiving means for receiving from said optical receiving means said reflected measuring light pulse and from said light beam splitter means, via said reference light path means, said second part of each light pulse as a reference light pulse and transforming each received light pulse into an electrical signal, electrical circuit means in said receiving channel for processing each electrical signal to produce time-related distance measuring signals for starting and stopping of said measurement of time of travel of each measuring light pulse, said receiving channel, on responding to each received light pulse having a recovery time which must elapse before the next light pulse can be processed, said reference light path means including intermediate its ends, connected to said light beam splitter and said electro-optical receiving means, first and second functionally parallel reference light path branches of different length and selector means for selecting one of such first and second reference light path branches for supplying the reference light pulse via the selected branch to said electro-optical receiving means, said first reference light path branch comprising a short reference light path branch to transit time through which for the reference light pulse is relatively short and said second reference light path branch comprising a long reference light path branch the transit time through which for the reference light pulse is relatively long, control means for controlling operation of said selector means as a function of target distance, the selector means being controlled to supply reference light pulses to the electro-optical receiving means from the short reference light path branch for long distance targets and for supply of reference light pulses to the electro-optical receiving means from the long reference light path branch for short distance targets, said relatively long transit time for the reference light pulse being at least equal to two times said recovery time of said receiving channel, and a time measuring means connected to the receiving channel and supplied therefrom with said time-related distance measuring signals for measuring the time of travel of each measuring light pulse.

4,521,108

FOCUSING DEVICE FOR OPTICAL SYSTEM

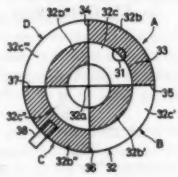
Yoshiaki Horikawa, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1982, Ser. No. 372,374

Claims priority, application Japan, Apr. 30, 1981, 56-64065; Apr. 30, 1981, 56-64066

Int. Cl.[3] **G01J** *1/00;* **G03B** *13/18*

U.S. Cl. 356—123 **17 Claims**



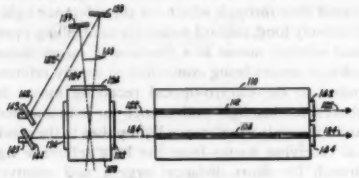
1. A focusing device for an optical system, comprising:

a light intercepting plate, having a rotational center which is not co-axial with an exit pupil of said optical system, arranged rotatably in a plane perpendicular to an optical axis of said optical system, said plate being near said exit pupil of said optical system, and said plate having a plurality of light transmitting parts and light intercepting parts arranged so that a first part which can pass light and a second part which can intercept light both appear in said pupil, wherein said light transmitting parts and light intercepting parts are so arranged that rotation of said plate by 360° causes the relative axial position of said first part and second part in said pupil to alternate periodically at predetermined interval during said rotation.

4,521,109
PASSIVELY Q-SWITCHED DUAL LASER

Peter P. Chenausky, Avon, Conn.; Robert J. Mongeon, East Longmeadow, Mass., and Lanny M. Laughmar., Bolton, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 369,303, Apr. 16, 1982,. This application Apr. 13, 1984, Ser. No. 600,041
Int. Cl.³ G01B 9/02
U.S. Cl. 356—349 2 Claims

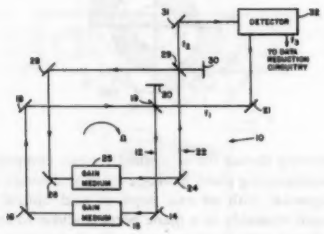


1. A laser ranging system for measuring round trip time to a target comprising:
- laser means for generating simultaneously a pair of pulsed optical beams at first and second optical frequencies separated by a predetermined frequency Δf;
- heterodyne means for detecting an interference signal at said frequency Δf having an initial phase;
- heterodyne means for detecting return radiation of said first and second frequencies and for generating a return signal at said frequency Δf having a return phase;
- phase means for measuring the phase difference between said initial phase and said return phase;
- means for generating a coarse measurement of said round trip time; and
- means for combining said phase difference with said coarse measurement of said round trip time to form an improved round trip time measurement.

4,521,110
DUAL CAVITY LASER GYRO

Thomas G. Roberts, Huntsville, and Thomas L. Honeycutt, Somerville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 13, 1982, Ser. No. 449,011
Int. Cl.³ G01C 19/64
U.S. Cl. 356—350 12 Claims

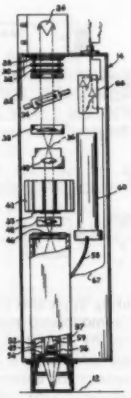


1. A dual cavity laser gyro for determining angular rotation of an area, comprising: first and second, parallel, optical paths each circumscribing an area of 360° and each providing a resonant cavity, a common gain medium disposed in the respective optical paths for providing physically separated optical mode volumes and for inducing separate laser oscillation in each cavity, first and second means coupled respectively to said first and second optical cavities for providing negative feedback therein for limiting laser oscillation to a single traveling wave in each cavity, said traveling wave in said first cavity being in the opposite direction to said traveling wave in the second cavity, means for extracting a portion of the laser oscillation from each cavity, and means for heterodyning the portions of removed laser oscillation for providing a beat frequency output.

4,521,111
APPARATUS FOR MEASUREMENT OF MOLECULAR ORIENTATION

Charles M. Paulson, Jr., and Mark E. Faulhaber, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 23, 1982, Ser. No. 401,331
Int. Cl.³ G01J 4/04
U.S. Cl. 356—367 4 Claims

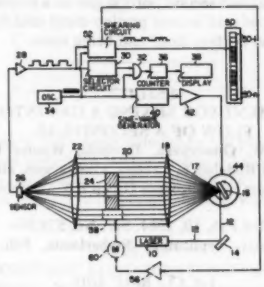


4. An apparatus comprising:
- means for establishing a beam of rotating linearly polarized light incident on an advancing polymeric film;
- an emission housing in and partially intercepting said incident beam;
- a fixed polarizer on said emission housing;
- a filter in the emission housing in the path of light emitted from the film, the optical paths of said incident and emitted light being coaxial;
- a first photodetector having a light sensitive element in the path of incident light passing through said fixed polarizer;
- a second photodetector having a light sensitive element in the path of emitted, filtered light; and
- a detection circuit connected to said first and second photodetectors, the latter providing synchronous and sinusoidal reference and analytical signals, respectively, to the detection circuit, said apparatus further comprising:
  - a support housing for said means and said emission housing; and
  - means mounting the support housing above and for traversing movement relative to the path of advance for said film.

4,521,112
OPTICAL MEASURING DEVICE WITH POSITION INDICATOR

Yoshiharu Kuwabara; Hiroyoshi Hamada, and Masayuki Kuwata, all of Kanagawa, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1982, Ser. No. 452,387
Claims priority, application Japan, Dec. 25, 1981, 56-215253
Int. Cl.³ G01B *11/02*
U.S. Cl. 356—375 **9 Claims**

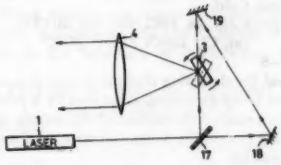


1. An optical measuring device comprising a parallel scanning ray beam generator, condensing means for condensing said parallel scanning ray beams after said parallel scanning ray beams have passed through a workpiece being measured, and a single light receiving element for sensing the brightness of said scanning ray beams condensed by said condensing means to convert the same into an electric signal, whereby the dimensions of said workpiece being measured are measured from the time length of a dark portion or a bright portion generated due to the obstruction of said parallel scanning ray beams by said workpiece being measured, which has been interposed between said parallel scanning ray beam generator and said light receiving element, characterized in that said device further comprises setting position display means having a plurality of light emitting elements arranged in opposed relations to the scanning scope of said parallel scanning ray beams and a time shearing circuit for time-shearing an output from said light receiving element during a single scanning time in accordance with the number of the light emitting elements of said setting position display means to thereby cause the light emitting elements of said setting position display means in accordance with the position of the workpiece being measured with respect to the scanning scope to emit lights.

4,521,113
OPTICAL MEASURING DEVICE

Yoshiharu Kuwabara; Yasuharu Takayama, and Hiroyoshi Hamada, all of Kanagawa, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,303
Claims priority, application Japan, Jun. 17, 1981, 56-93543
Int. Cl.³ G01B *11/02*
U.S. Cl. 356—387 **7 Claims**

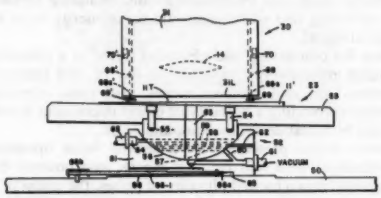


1. An optical measuring device wherein said device having a parallel scanning beam generator comprising a beam generator, a rotary mirror for reflecting incident beams into said scanning beams and a collimator lens for converting said rotary scanning beams from said rotary mirror into parallel scanning beams, wherein a workpiece to be measured is interposed between said parallel scanning beam generator and a light receiving element, and dimensions of the workpiece are measured from the time length of a dark portion or a bright portion generated due to the obstruction of the parallel scanning beams by the workpiece, characterized in that said rotary mirror is formed into as a plate-shaped one, opposite surfaces of which are reflectory surfaces, and said parallel scanning beam generator has a beam transmitting mechanism, in which the beams from said beam generator are split into two and the split beams are caused to be incident upon said rotary mirror from two directions opposite to each other, whereby the two reflectory surfaces of said rotary mirror alternately reflect the split beams from the two directions.

4,521,114
SINGLE LENS REPEATER

Christian K. Van Peski, Hidden Hills, and William L. Meisenheimer, Agoura, both of Calif., assignors to TRE Semiconductor Equipment Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 238,148, Feb. 25, 1981, abandoned, which is a continuation of Ser. No. 38,349, May 11, 1979, abandoned. This application Dec. 14, 1981, Ser. No. 330,498
Int. Cl.³ G01B *11/00*; B25B *11/00*
U.S. Cl. 356—401 **10 Claims**



1. An apparatus useful in a semiconductor wafer photoexposure system of the type having a camera for exposing said wafer to produce semiconductor devices, said apparatus achieving spaced parallel alignment of the surface of said semiconductor wafer with a reference plane that is associated with the body of the camera of said system and is in spaced facing relationship with said wafer surface, comprising:

a platform for supporting said wafer;

a spherical air bearing mounting for said platform,

a plurality of channels in said camera body for conducting gas under pressure to openings in said camera body facing said wafer surface so as to form gas jets directed toward said semiconductor wafer,

pressure sensor associated with each of said channels to sense the gas back-pressure therewithin,

means for applying gas via said channels so that the force of said gas jets applied against said wafer will cause said wafer and said platform to move within said air bearing mounting until the back-pressure condition indicating that the distance from each of said openings to said wafer surface is equal, whereby said parallel alignment between said semiconductor wafer and the reference plane of said camera body is achieved,

vacuum clamping means for locking with said spherical air bearing mounting to prevent further movement of said platform therewithin, said vacuum clamping means being actuated upon detection by said sensors of said equal back-pressure condition, and

means for moving said camera body toward and away from said semiconductor wafer, and

focusing means for causing said moving means to move said body relative to said wafer until the level of back pressure

uniformly sensed at all of said sensors is equal to a preselected value, said value corresponding to a spacing between said body end and with wafer at which said camera is exactly focused on said surface.

4,521,115

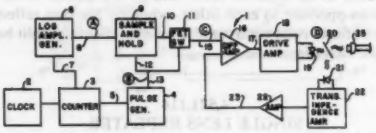
PULSE CODED OPTICAL ATTENUATION METER

John W. Higginbotham, St. Charles County, Mo., and Dennis C. Dowden, Orange County, Fla., assignors to McDonnell Douglas Corporation, St. Louis County, Mo.

Filed May 21, 1982, Ser. No. 380,705

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—432 **13 Claims**



1. A device for measuring attenuation, comprising:

transmitter means for generating an electrical signal including means for converting said electrical signal to electromagnetic wave energy for transmission from said transmitting means;

receiver means for receiving said electromagnetic wave energy from said transmitter means, including means for converting said electromagnetic wave energy to an electrical signal;

means for converting said electrical signal to a plurality of pulses operatively connected to one of said transmitter means and said receiver means, said pulse converting means providing a plurality of pulses decreasing in amplitude by equal decibel values; and

counter means presettable to a desired value operatively associated with said receiver means, said counter being counted down by said plurality of pulses, the count of said counter after count down corresponding to the attenuation of said electromagnetic wave energy during passage of said electromagnetic wave energy between said transmitter means and said receiver means.

4,521,116

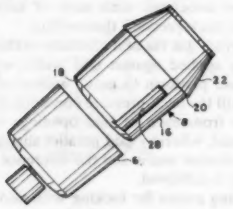
MIXING APPARATUS WITH REMOVABLE DRUM LINER

Gordon H. Adsit, Lake Wales, Fla., assignor to Gordon W. Orthner, Tampa, Fla.

Filed Jun. 1, 1984, Ser. No. 616,121

Int. Cl.³ B28C *5/18*

U.S. Cl. 366—54 **8 Claims**



1. Apparatus for mixing concrete or the like, comprising;

a support frame;

rotational drive means mounted to said frame;

liner supporting means rotatably connected to said rotational drive means; and

drum liner means removably connected to and supported by said drum liner supporting means and comprising a container having a first axial portion of generally cylindrical configuration having one closed end and other open end and a second axial portion joined to said first portion at said open end thereof, said first portion having said closed end being received within said drum liner supporting means and said second portion remaining outside said drum liner supporting means and having the configuration of a body of revolution tapering from a diameter approximately the diameter of said first portion where said first portion and said second portion join to a smaller diameter at the end of said second portion distal said first portion, said second portion distal end being open.

4,521,117

ARRANGEMENT FOR MIXING A GAS INTO A MAIN FLOW OF A SECOND GAS

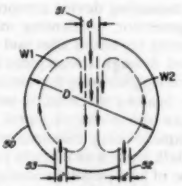
Johannes H. W. Ouwerkerk, Driehuis; Wouter B. Lucieer, Schagen, and Rudolph E. Cramer, Oudkarspel, all of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Feb. 10, 1984, Ser. No. 578,846

Claims priority, application Netherlands, Feb. 17, 1983, 8300590

Int. Cl.³ B01F *3/03*

U.S. Cl. 366—165 **6 Claims**



1. In a conduit system having an arrangement for mixing a first gas into a main flow of a second gas, comprising a main conduit bounded by a wall for said main flow and a plurality of supply conduits for the first gas which open into said main conduit, the improvement that

said supply conduits opening into said main conduit provide at least one set of three outlet openings for the first gas into the main flow, which set of openings consists of a first opening which opens into the main flow perpendicularly to the wall and two second openings which are arranged so as each to provide a lesser flow rate of the first gas in operation than said first opening and are offset with respect to said first opening so that the three openings of the set in operation direct the first gas into two contra-rotating circulatory movements, as viewed in the direction of the axis of the main conduit.

4,521,118

METHOD FOR DETECTION OF THERMAL WAVES WITH A LASER PROBE

Allan Rosencwaig, Danville, Calif., assignor to Therma-Wave, Inc., Fremont, Calif.

Filed Jul. 26, 1982, Ser. No. 401,511

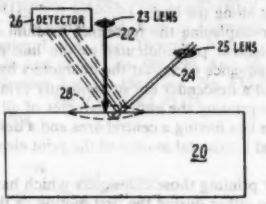
Int. Cl.³ G01N *21/41, 25/72*

U.S. Cl. 374—5 **15 Claims**

1. A method for detecting thermal waves in a sample, said thermal waves being generated in an area by a periodic localized heating at a spot on the surface of the sample, said thermal waves radiating outwardly from said spot, said method comprising the steps of:

focusing a probe beam of energy within a preselected portion of said area on the surface of the sample which is being periodically heated by the thermal waves, in a manner such that said beam is reflected from said surface; and

monitoring the periodic angular displacement of the reflected probe beam, said periodic displacement resulting from the periodic local angular change in the surface

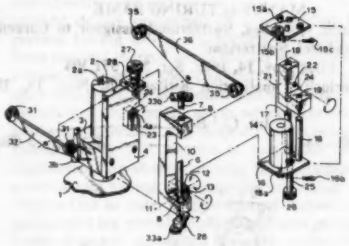


conditions of the sample induced by the presence of thermal waves generated by said periodic localized heating, whereby the periodic displacement of the reflected probe beam can be used to detect the thermal waves.

4,521,119
CONSTANT LOAD DILATOMETERS

Anthony C. Stepke, New Hyde Park, and Gerhard R. Clusener, Manhasset, both of N.Y., assignors to Theta Industries, Inc., Port Washington, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,180
Int. Cl.³ G01N *25/16*
U.S. Cl. 374—56 **20 Claims**



1. Apparatus for independently supporting and adjusting the alignment of a member selected from the coil and core of a linear variable differential transformer comprising

(a) a collar which is adapted to slidably engage an elongated extension of said selected member to permit linear movemnt thereof on its longitudinal axis and

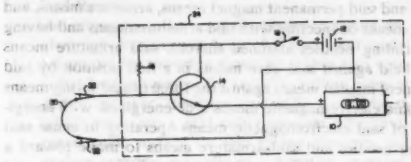
(b) adjustable clamping means coupled to said collar for holding and tilting said collar and said selected member on at least one plane parallel to said axis.

4,521,120
FOREST FIRE RATE OF SPREAD WITH TIMERS METHOD

Richard W. Blank, Haslett, and Albert J. Simard, Dumond Dale, both of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 15, 1983, Ser. No. 532,411
Int. Cl.³ G01K *3/04*
U.S. Cl. 374—102 **5 Claims**

1. A method for determining the rate of spread of a forest fire comprising the steps of: locating at least three temperature-actuated timers in a spatial pattern in the expected path of a forest fire, each timer having a low melting alloy switch detachably connected thereto; allowing the forest fire to pass over each one of the timers, thereby melting said switch and actuating each of the timers when the fire reaches said timers; recovering said timers; determining the differences between

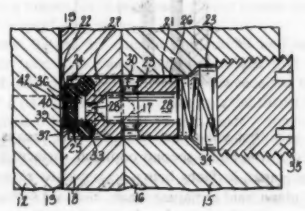


the times of actuation of said timers; measuring the distance between timers, correlating the time differences and distance measurements to determine the rate of spread of the forest fire.

4,521,121
AIR BEARING

Gregory L. Klein, York, and C. Leonard Burton, Clover, both of S.C., assignors to Textron Inc., Providence, R.I.

Filed Aug. 8, 1983, Ser. No. 521,035
Int. Cl.³ F16C *32/06, 33/10*; F15D *1/08*
U.S. Cl. 384—100 **5 Claims**



1. An inlet nozzle assembly for an air bearing adapted to supply air under pressure to the gap between facing surfaces of relatively movable first and second machine elements, one of said elements being provided with a bore terminating at said surface of said element, said bore having a reduced diameter portion adjacent said surface and an annular seat adjacent said reduced diameter bore portion, the nozzle assembly comprising, a thin metering disc of a durable material traversed by an axially extending air-metering orifice, the disc having a centrally located reduced diameter portion adapted to rest in the reduced diameter portion of the bore, an O-ring resting against a peripheral portion of the disc on its side opposite the reduced diameter portion, a tubular thimble element fitting freely in said bore and having one end resting against the O-ring, a spring resting against an opposite end of the thimble element, a retaining element removably engaged in said bore in a position to compress the spring against said opposite end of the thimble, whereby the thimble compresses the O-ring against the disc and holds the disc against the annular seat, the means for supplying air under pressure to the nozzle assembly.

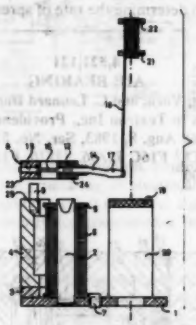
4,521,122
NEEDLE PRINTER ASSEMBLY

Rolf Schäfer, Villingen-Schwenningen; Peter Vogelhuber, Brigachtal, and Hans-Joachim Wysk, Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Dec. 8, 1982, Ser. No. 448,020
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149300
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **12 Claims**

1. A needle printing device comprising a base plate of magnetic material, a plurality of printing needles, electromagnetic

means including core means operating to individually actuate said printing needles, permanent magnet means, yoke means defining a magnetic flux path between said electromagnetic means and said permanent magnet means, armature means, and spring means connecting with said armature means and having said printing needles attached thereto, said armature means being held against said core means in a first position by said permanent magnet means against the force of said spring means when said electromagnetic means is de-energized, with energization of said electromagnetic means operating to cause said printing needles and said armature means to move toward a printing position under the influence of said spring means, said yoke means including a first and a second yoke part, with said second yoke part having said armature means arranged



thereon, said first yoke part and said core means having, respectively, a first and a second coplanar surface, said first and second coplanar surfaces being arranged to extend in a first common plane, said armature means and said second yoke part having, respectively, a third and a fourth coplanar surface, said third and fourth coplanar surfaces being arranged to extend in a second common plane, said needle printing device being constructed so that when said electromagnetic means is de-energized with said armature means held in said first position said second common plane is immediately adjacent and parallel to said first common plane and said third coplanar surface of said armature means and said second coplanar surface of said core means lie parallel with and flat against each other in abutting relationship.

4,521,123

METHOD AND APPARATUS FOR THE REPRESENTATION OF CHARACTERS

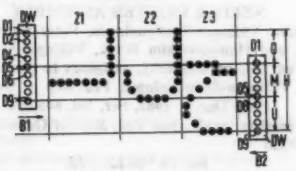
Georg Boehmer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 530,622

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1982, 3235676

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **11 Claims**



11. In an apparatus for representing characters having a central area within a middle zone for and in an upper zone or in a lower zone descenders or ascenders comprising:

means for printing the entire character of all those characters in a line which have a central area and/or at least one ascender during a first horizontal motion of the print element along the line;

means for displacing the recording medium relative to the print element perpendicular to the line direction by a partial advance such that the characters having a central area and a descender are subsequently printable;

means for printing the entire character of all those characters in a line having a central area and a descender during a second horizontal motion of the print element along the line;

means for printing those characters which have only a central area either during the first motion or the second motion of the print element; and

means for displacing the recording medium relative to the print element in accord with a line feed after printing all the characters of a line;

whereby, characters having a central area and an ascender are printed during a first horizontal movement of said carriage means and characters having a central area and a descender are printed during a second horizontal movement of said carriage means after said platen means has been rotated by a partial advance in an amount equal to the height of one zone, characters having only a central area being printed during either said first movement or said second movement.

4,521,124

CHARACTERS CARRYING PRINT WHEEL DISC FOR PRINTING MACHINE AND METHOD OF MANUFACTURING SAME

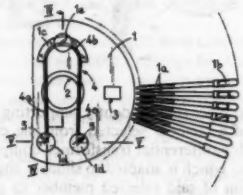
Blaise Moulin, Corcelles, Switzerland, assignor to Caracteres S.A., Neuchatel, Switzerland

Filed Nov. 14, 1983, Ser. No. 551,304

Claims priority, application Switzerland, Nov. 15, 1982, 6638/82

Int. Cl.³ B41J *1/04*

U.S. Cl. 400—144.2 **3 Claims**



1. In a characters carrying print wheel disc for a printing machine of the type which includes a shaft for mounting the wheel, having means for mounting the disc on the shaft, including a U-shaped wire spring on the disc, said spring having a bend and a pair of elastically yieldable arms, each arm having a free end and being convergently biased; and means mounting the spring to the disc comprising first and second raised protrusions, said first raised protrusion comprising a first post unitary with the disc and having an overhang, said first post having an arc identical with the arc of the bend and a pair of side by side second posts longitudinally displaced from said first post and opposite thereto, said second posts each having lateral walls defining a 90 degree sector recess, said recesses opening away from each other, one wall defining an axial abutment relative to the respective spring arms and a second wall perpendicular to the one wall defining a lateral abutment relative to the spring arm, said spring disposed with its bend engaged conformingly on said first post below said overhang and its arms seated engaged within said respective recesses, the free ends bearing axially on the axial abutment while simultaneously

engaged on the lateral abutment whereby longitudinal displacement of the spring is prevented.

4,521,125

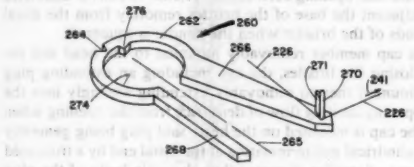
RIBBON CASSETTE ASSEMBLY

Klaus Turbon, Wuppertal, Fed. Rep. of Germany, assignor to Turbon Plastics, U.S.A., Inc., Denville, N.J.

Continuation-in-part of Ser. No. 488,190, Apr. 25, 1983,. This application Jan. 24, 1984, Ser. No. 573,370

Int. Cl.³ B41J *35/28*

U.S. Cl. 400—208 **3 Claims**



1. A ribbon cassette assembly which comprises:

a cassette housing including a ribbon exit arm and a ribbon entry arm;

a ribbon supply spool positioned within said housing, said ribbon supply spool including a shaft member having a serrated surface;

a ribbon take-up spool positioned within said housing;

a ribbon coursed between said ribbon supply spool and said ribbon take-up spool via said ribbon exit arm and said ribbon entry arm; and

a braking device comprised of a segmented ring-shaped portion having a first leg portion extending outwardly from one end thereof, and a second leg portion extending outwardly from another end thereof, one of said leg portions being fixedly positioned and said other leg portion including a pin member about which is coursed said ribbon, said segmented ring-shaped portion being positioned concentrically with respect to said shaft member, said segmented ring-shaped portion being formed of plastic material and having an outwardly extending radial notch disposed on an outer surface thereof opposite to said first and second leg portions; said ring-shaped portion having a tooth member extending from a cylindrical surface thereof at a position between said radial notch and said other leg portion including said pin member; sad tooth member engaging said serrated surface of said shaft member to brake said ribbon supply spool during the condition said ribbon take-up spool is inoperative, and said tooth member being disengaged from said serrated surface of said shaft member to release said ribbon supply spool during the condition said ribbon take-up spool is rotated.

4,521,126

MECHANICAL PENCIL

Gouji Sakaoka, Kawasaki, and Takashi Ishikawa, Toride, both of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1982, Ser. No. 408,719

Claims priority, application Japan, Aug. 31, 1981, 56-129024; Oct. 21, 1981, 56-156775; Oct. 21, 1981, 56-156776

Int. Cl.³ B43K *21/16, 21/22*

U.S. Cl. 401—65 **4 Claims**

1. A mechanical pencil comprising:

a tubular casing;

a centrally apertured conical tip piece connected to an end of said casing to form a pencil tip, said tip piece having therein a sleeve projecting longitudinally from said tip piece and a lead retaining ring for frictionally holding the lead therein;

a lead engaging collet normally biased to spring open from clamping engagement with the lead, said collet being longitudinally movably mounted within said casing, said collet having recesses for securing rolling elements;

a collet receiver tube longitudinally movably mounted within said casing, said collet receiver tube having a tapered guide surface for said rolling elements, said guide surface tapering inwardly in a direction opposite to said pencil tip such that movement of said collet receiver tube in a first direction towards said pencil tip relative to said collet induces a lead gripping force of said collet against the lead;

first spring means for biasing said collet rearwardly in a second direction opposite to said first direction relative to said collet receiver tube;

second spring means for biasing said collet receiver tube rearwardly in said second direction relative to said casing;

an actuation button means mounted on said casing;

a cylindrical pusher means longitudinally movably mounted within said casing for advancing said collet and said collet receiver tube towards said pencil tip, said pusher means being connected to said actuation button means;

third spring means for biasing said pusher means rearwardly in said second direction;

engagement means for causing said collet and said collet receiver tube to advance together in said first direction towards said pencil tip until said collet receiver tube abuts against a part of said casing when an axial thrust is applied through said button means to said pusher means, and for causing said collet to advance further in said first direction after the forward movement of said collet receiver tube is restricted by such abutment, while enabling said collet receiver tube to be moved by said second spring means in said second direction when the forward thrust is continued, thereby preventing said collet receiver tube from drawing the lead back into the casing upon release of the forward thrust, said engagement means comprising a first friction projection extending inwardly from said collet receiver tube towards an axis of said casing, and a second friction projection extending from said pusher means outwardly from said axis of said casing, said first friction projection being frictionally engageable with said second friction projection when said pusher means is advanced towards said pencil tip; and

said conical tip piece having a rearwardly projecting portion having a rearwardly tapered outer surface, and said collet having a forwardly projecting portion having a forwardly flared inner surface, whereby when said collet is fully advanced towards said pencil tip, said projecting portion of the collet slides on said outer surface of said projecting portion of the conical tip piece so that said collet is opened to permit a new lead to be dropped through the opened collet.

4,521,127

SEALED PROPULSION MECHANISM FOR A STICK-DEODORANT OR THE LIKE CONTAINER

Anthony F. Tomburo, Cranford, and Nicholas W. Kachur, Clark, both of N.J., assignors to Gibson Associates, Inc., Cranford, N.J.

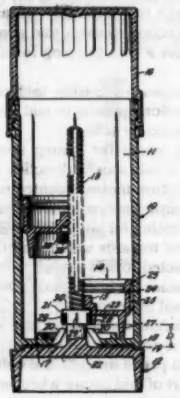
Filed Nov. 30, 1982, Ser. No. 445,429

Int. Cl.³ A45D *40/06*

U.S. Cl. 401—68 **8 Claims**

1. In a stick-deodorant or the like container, wherein a tubular housing with a cylindrical bore is closed at one end by a rotatable base-actuating member having a central threaded stem extending within said housing and on the axis of said bore, wherein a piston member has centrally threaded engagement

with said stem and is externally configurated for circumferentially continuously sealed and axially stabilized piloting engagement with said bore, and wherein said stem and piston have ratcheting engagement to retain a lower-limit position of piston retraction within said housing, the improvement wherein at the location of ratcheting engagement said stem is characterized by a circumferentially continuous hub presenting a generally radial annular upper surface to the underside of said piston member, wherein the underside of said piston member integrally includes a downwardly projecting compliantly deformable skirt which axially overlaps at least part of said hub



when said piston member is in its lowermost position, said skirt and hub having ratcheting formations which coact to retain one of a relatively large plurality of possible detent positions per single rotation of said threaded engagement, and the underside of said piston member integrally including within said skirt a circumferentially uniform and continuous downward relatively compliant projection that is radially localized for compressionally loaded and circumferentially sealed engagement with said annular surface when in ratcheted lower-limit position, whereby the sealed engagement can protect the ratchet engagement against fouling when the container is being filled with deodorant or the like cosmetic substance.

4,521,128

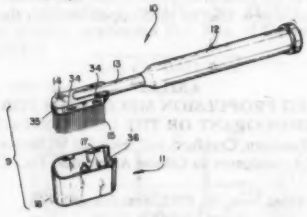
DISPOSABLE TOOTHBRUSH WITH CAP

Chester L. O'Neal, 809 Gardenside Dr., Greencastle, Ind. 46135

Continuation of Ser. No. 370,454, Apr. 21, 1982, abandoned. This application Dec. 21, 1983, Ser. No. 564,034

Int. Cl.³ A46B *11/02*

U.S. Cl. 401—183 **1 Claim**



1. A disposable toothbrush device comprising:

A. a unitary toothbrush member comprising:

a squeezable tubular handle with a dispensing end and a filler end and forming a container extending therebetween adapted to hold dentifrice to be dispensed, the tubular handle having a rigid thick portion of the circumference integrally connected to a flexible thin portion of the circumference, both portions extending from the dispensing end to a location immediately adjacent the filler end whereby the thin portion of the circumference of the handle can be pressed against the rigid portion to force dentifrice out of the dispensing end;

a shank connecting the dispensing end of the handle to a brush head;

a brush head connected to the shank with bristles extending outwardly therefrom; and

a passage leading from the handle through the shank to the head and opening between the bristles to deliver dentifrice adjacent the base of the bristles remotely from the distal ends of the bristles when the handle is squeezed;

B. a cap member removably mounted to the head and enclosing the bristles, the cap including an extending plug mounted thereto removably extending sealingly into the opening limiting flow of dentifrice from the opening when the cap is mounted on the head, said plug being generally cylindrical and terminating at the distal end by a truncated cone of smaller diameter than the main body of the plug thereby defining a shoulder adjacent the distal end and contactable against the head, the shoulder and the distal end cooperatively sealing the passage when the cap is mounted to the head; the cap including a free edge portion with inwardly projecting tabs on the two long edges thereof lockingly engaging cooperation seduring means on the edge portion of said head, removably securing the cap on the head, the free edge portion of the cap having a cut away portion receiving the shank and limiting movement thereon; and

C. a closure member adapted to close the said filler end of said tubular handle.

4,521,129

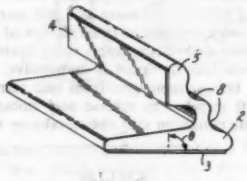
ELASTOMERIC PAVEMENT MARKER HAVING IMPROVED CONFIGURATION

Thomas D. Krech, Cottage Grove, and David C. May, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 17, 1983, Ser. No. 505,382

Int. Cl.³ E01F *9/06*

U.S. Cl. 404—10 **10 Claims**



1. A pavement marker comprising a body:

(a) made of an elastomer having a compressive strength at 25% compression of about 40 to 100 kilopascals;

(b) having a base portion with an approximately flat bottom which can be attached to a road without using either an anchor or a recess in the pavement;

(c) having a raised surface adapted to face on-coming traffic when the marker is mounted on a road, to which surface is attached a reflective material; and

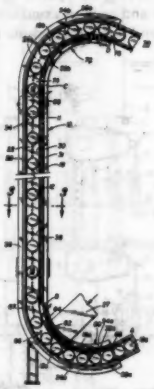
(d) having a shape which supports the raised surface through a connecting portion of the body extending between the back of the raised surface and the base portion, said connecting portion forming an acute angle with the plane of the bottom of the base portion and having at least two ribs located on the back side of said connecting portion which ribs are oriented parallel to the plane of the base portion.

4,521,130

AIR TRANSPORT SYSTEM

Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.

Division of Ser. No. 947,441, Oct. 2, 1978, Pat. No. 4,451,182.
This application Mar. 21, 1984, Ser. No. 591,942
Int. Cl.³ B65G 51/02
U.S. Cl. 406—86 7 Claims



1. A method of vertically and serially transporting cylindrical articles which rotate along their longitudinal axis, said method comprising:

providing a conduit with a wall structure having a rectangular cross-section with spaced side walls and spaced end walls having dimensions just slightly greater than the profile of the articles to provide an effective air seal between adjacent air spaces formed between adjacent articles, the conduit having an inlet end and an outlet end, the inlet end being lower than the outlet end;

introducing the articles into the inlet end of the conduit at predetermined-spaced intervals, the longitudinal axes of said articles being in a generally horizontal orientation;

injecting air as jets into the conduit through the end walls along the length thereof at a downstream angle to impinge upon each end of an article to center and propel the article along the conduit while injecting air into the spaces between articles, the air supplied by the jets being sufficient to maintain the velocity of the articles through the conduit;

providing a back pressure at the inlet to maintain a positive static pressure in the conduit;

providing a decreasing pressure gradient in the respective air spaces between adjacent articles from the inlet to the outlet to maintain separation between the articles; and

exhausting air from the air spaces through one of the conduit side walls in a direction which is lateral to the axes of the articles so that the articles move against and roll along the one side wall.

4,521,131

LIGHTWEIGHT SEMI-FLEXIBLE DIKE

Samlal Nandlal, Slidell, La., assignor to Shell Offshore Inc., Houston, Tex.

Filed May 14, 1984, Ser. No. 610,228
Int. Cl.³ E02B 3/10
U.S. Cl. 405—116 14 Claims

1. A method of installing an erosion-preventing lightweight, semi-permeable, semi-flexible structure in the form of a dike for erosion control of a bank along a body of water,

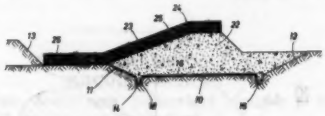
excavating a trench on the land forming a bank along a body of water,

covering the trench and at least the trench wall toward the water with a first woven synthetic permeable flexible fabric to form a trench cover to separate dike building material from the trench subsoil and to inhibit the migration of fines into the underlying soils,

mixing shells, sand and cement together to form the necessary volume of dike construction material,

spreading a series of shallow layers of said shell-sand-cement mixture of dike material in the trench,

compacting the shell-sand-cement mixture between layers above the water level prior to adding another layer,



repeating the steps of adding and compacting additional layers of dike material until the crest elevation and at least the selected water-side slope of the dike has been attained,

covering the crest and the water-side slope of the dike with a second synthetic flexible fabric to form a dike cover permeable to water and impermeable to substantially all of the fine solid material in the shell-sand-cement mixture, and

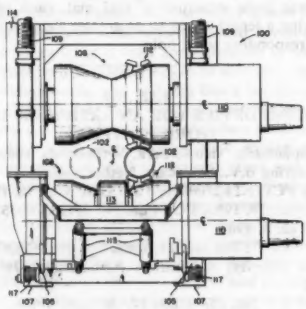
anchoring to at least the top and water-side slope of the dike said second synthetic flexible fabric dike cover.

4,521,132

APPARATUS AND METHOD FOR SIMULTANEOUSLY TENSIONING PIPES

John E. Isakson, Island County, and H. Eugene Nutting, Snohomish County, both of Wash., assignors to Western Gear Machinery Co., Everett, Wash.

Filed May 16, 1983, Ser. No. 494,811
Int. Cl.³ B63B 35/04; B65H 17/34
U.S. Cl. 405—166 20 Claims



1. A method for simultaneously tensioning at least two relatively small diameter pipes during a pipe-laying operation on a barge having axially aligned pipe tensioners which are capable of simultaneously tensioning the same relatively large diameter pipe in a conventional pipe-laying operation, comprising the steps of:

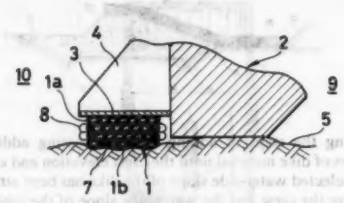
(a) tensioning a first pipe with a first pipe tensioner while freely passing a second pipe through the first pipe tensioner so that the first pipe tensioner does not apply a tensioning force to engage the second pipe; and

(b) tensioning the second pipe with a second pipe tensioner, axially aligned behind the first pipe tensioner, while freely passing the first pipe through the second pipe tensioner so that the second pipe tensioner does not apply a tensioning force to the first pipe.

4,521,133
CAISSON FOR UNDERWATER STRUCTURES

Shoichi Suzuki, Hiratsuka; Wataru Ohta, Ninomiyamachi; Noriaki Sakurai, Kurashiki, and Michio Yamashita, Fukuyama, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1982, Ser. No. 443,109
Claims priority, application Japan, Nov. 20, 1981, 56-172151[U]
Int. Cl.³ E02D *23/16, 27/18, 27/52*
U.S. Cl. 405—195 8 Claims



1. A caisson for an underwater structure designed to seal the space between the underside of a frame and bedrock underwater, comprising:

an elongated sponge mat positioned along the outer edge of the base of said frame and arranged to be compressed between a portion of said frame and said bedrock, said sponge mat being molded from a plastic material and comprising a skin of a dense foam structure and an interior of a coarse foam structure;

a plurality of small holes in said sponge mat for admitting water to said interior coarse foam structure, said holes extending crosswise from one side of said mat to the other side through said skin and said interior coarse foam structure, and

at least one rope passing through each of said small holes and serving to prevent collapse of said holes when said mat is compressed and allow drainage of water from said interior coarse foam structure of said mat, each of said ropes having a length equal to or greater than the length of its corresponding small hole.

4,521,134
ELEVATING DEVICE FOR AN ARTIFICIAL ISLAND OR WORK PLATFORM

Wim Schoonmade, Nieuwerkerk, Netherlands, assignor to Gusto Engineering B.V., Schiedam, Netherlands

PCT No. PCT/NL82/00025, § 371 Date Mar. 18, 1983, § 102(e) Date Mar. 18, 1983, PCT Pub. No. WO83/00351, PCT Pub. Date Feb. 3, 1983
PCT Filed Jul. 21, 1982, Ser. No. 476,875
Claims priority, application Netherlands, Jul. 21, 1981, 8103452
Int. Cl.³ E02B *17/08;* B66F *7/00*
U.S. Cl. 405—198 1 Claim

1. In a work platform:

a work floor;

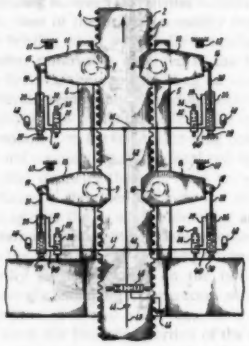
a frame on said work floor;

at least one column extending through an opening in said work floor and through said frame and having at least first and second gear racks conected thereto;

means for displacing said at least one column vertically with respect to said work floor and frame;

said means including a plurality of first and second elevating devices respectively associated with said first and second gear rack;

each elevating device comprising: a pinion mounted on said frame and meshing with one of said gear racks; a reaction arm; a motor, a brake and a driving gear having an output shaft, all mounted on said reaction arm; said brake and said motor being operatively connected to said driving gear; said reaction arm being pivotable about said output shaft and having a free end; gearing interposed between said pinion and said driving gear; hydraulic means interposed between said free end of said arm and said work floor, and having a cylinder, a piston in said cylinder and defining therewith a first and second chamber on opposite sides of said piston in said cylinder; a valve associated with each cylinder and having an open position and a closed position; and first and second conduits respectively connecting said first and second conduits to said valve;



and compensation means, common to said plurality of elevating devices, and comprising:

conduit means interconnecting said valves;

and means operatively connected to said valves and to said motors and to said brakes, and operable to move said valves to said closed position in which said conduit means is shut off from said first and second conduits, when said motors are in operation, and to said open position in which said conduit means is connected to said first and second conduits, when said brakes are in operation.

4,521,135
PRESSURIZED GAS FILLED TENDONS

William H. Silcox, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 28, 1983, Ser. No. 508,743
Int. Cl.³ E02B *17/00;* B63B *35/44*
U.S. Cl. 405—224 20 Claims

1. Apparatus for detecting a leak in a tension leg platform tendon, comprising:

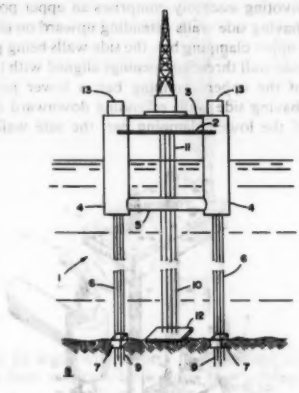
a fluid tight, tubular tendon;

means for supplying gaseous fluid to said tendon;

means for pressurizing said gaseous fluid in excess of the maximum hydrostatic pressure exerted by the sea water on said tendon;

means for monitoring pressure, said means monitoring variations in gaseous fluid pressure in said tendon;

means for connecting an upper end of said tendon to a buoyant offshore structure;



means for connecting a lower end of said tendon to an anchor means connected to the sea floor.

4,521,136

RAPIDLY DISSOLVABLE SILICATES AND METHODS OF USING THE SAME

Joseph R. Murphey, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 265,821, May 21, 1981, Pat. No. 4,391,643. This application Sep. 27, 1982, Ser. No. 423,910

Int. Cl.³ E02D *3/12*

U.S. Cl. 405—263 **6 Claims**

1. A method of preparing an earth formation for bonding with cement comprising the steps of preparing an aqueous solution of potassium silicate by dissolving in water a highly dissolvable partially hydrated powdered potassium silicate having a water content in the range of from about 14 percent to about 16 percent by weight of said partially hydrated powdered silicate and wherein said powder is comprised of amorphous particles of said potassium silicate and flushing the earth formation with said aqueous solution of potassium silicate, said partially hydrated amorphous potassium silicate having a molar ratio of silicon dioxide to potassium oxide in the range of from about 1.5:1 to about 3.3:1.

4,521,137

MOVABLE CASING FOR THE EXCAVATION OF TRENCHES

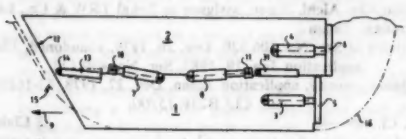
Maria Brecht, Grosse Rheinstrasse 99, Philippsburg, Fed. Rep. of Germany (7522)

Filed Jul. 29, 1983, Ser. No. 518,345

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3234440

Int. Cl.³ E02D *17/08*

U.S. Cl. 405—283 **10 Claims**



1. A trenching casing for the continuously advancing excavation and refilling of trenches for the installation of ducts, said casing having spaced side walls consisting of at least two vertically adjacent sections, engaging means for supporting said sections movably relative to one another, at least one rear face plate supported—in the advancing direction—at the rear end of each casing section, essentially horizontal hydraulic cylinders mounted on each casing section and connected to the respective rear face plate for forcing said rear face plate against the ground behind the casing and hydraulic operating means extending between and having one end operatively connected to one and the other end to the other of said vertically adjacent casing sections for transmitting an advancing force between said sections for longitudinally moving one of the two adjacent casing sections while the other remains in position and provides the backup for the advancing force applied to said one section.

4,521,138

BUILDING BLOCKS

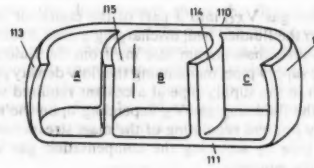
Alfred Steiner, Andelfingen, Switzerland, assignor to Steiner Silidur AG, Andelfingen, Switzerland

Division of Ser. No. 208,217, Nov. 19, 1980, Pat. No. 4,379,659. This application Sep. 9, 1982, Ser. No. 416,206

Claims priority, application Switzerland, Sep. 5, 1980, 6698/80; Sep. 5, 1980, 6699/80

Int. Cl.³ E02D *29/02*; E04C *2/04*

U.S. Cl. 405—284 **12 Claims**



1. A building block for walls which are laid in courses without mortar and can be stabilized by planting, comprising, in combination, a solid base wall, a face wall, and two side walls, said base wall having rounded transition sections to the face wall and to the side walls, and at least two additional dividing walls bounding a central space and two outer spaces between the side walls, said face wall, side walls and dividing walls having upper edges lying at least approximately in one plane extending throughout the upper edges of said face wall, side walls and dividing walls, said building block being open at a rear thereof opposite said face wall, and said building block having an open top extending in said one plane from said open rear to said face wall, each dividing wall having a height extending from said base wall to said one plane and a depth extending from said face wall to said open rear, all sides of said dividing walls extending uninterruptedly from said solid base wall in parallel to and for the full extent of said height to said one plane at said open top, said dividing walls extending for their entire depths along said one plane at said open top from said face wall to said open rear, and each of said dividing walls being curved such that said central space has its greatest dimension in a central region thereof between said face wall and said rear.

4,521,139

METHOD OF REGULATING MASS STREAMS

Horst Kretschmer; Guenter Tietze; Juergen Noack; Hans-Joachim Schweigel; Manfred Schingnitz; Klaus Werner, all of Freiberg, and Bernd Kirsch, Hoyerswerda, all of German Democratic Rep., assignors to Brennstoffinstitut Freiberg, Freiberg, German Democratic Rep.

Filed Jul. 19, 1982, Ser. No. 399,989

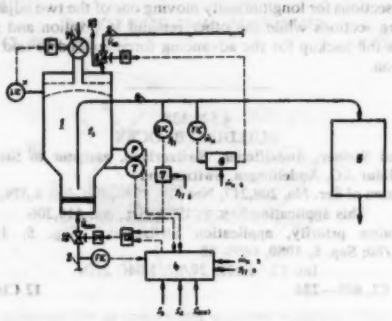
Claims priority, application German Democratic Rep., Jul. 17, 1981, 231889

Int. Cl.³ B65G *51/02*

U.S. Cl. 406—19 **7 Claims**

1. A method of regulating a continuous mass stream of a

finely divided, fine-grained solid fuel which is conveyed pneumatically at an arbitrary concentration and pressure from a closed dosing container through a supply pipe to a gasification reactor or a burner of a heater or steam boiler, comprising the steps of charging the solid fuel into the closed dosing container to create therein a charge of a bulk density ρ_S; forming a fluidized bed in the charge near the bottom part of the container by means of supplying a fluidizing gas V_G; feeding a



compensation gas V_{KG} into a part of the container which is remote from the fluidizd bed; discharging a mass stream of the solid fuel with a mass stream rate m_K from the fluidized bed through the supply pipe; maintaining the flow density ρ_{Π} of the mass stream in the supply pipe at a costant required value by regulation the fluidizing gas V_G depending upon the required flow density ρ_{Π}; and regulating of the mass stream rate m_K in the supply pipe by adjusting the compensation gas V_{KG} according to the equation

$$\dot{V}_{KG} = \frac{\dot{m}_K}{S}.$$

4,521,140

JIG

George C. Doescher, and Jim W. Clark, both of P.O. Box 935, both of Houma, La. 70361

Filed Oct. 3, 1983, Ser. No. 538,150

Int. Cl.³ B23B *45/14*

U.S. Cl. 408—97 **4 Claims**

1. A jig for supporting a drill or similar tool during operation which comprises:

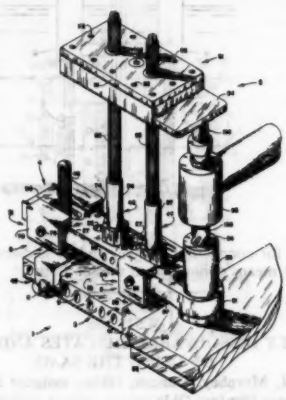
(a) a clamping assembly having an upper and lower clamping bar hingedly attached to one another by a movable pivoting assembly and having means movably attached at one of the opposing ends of the upper and lower bars to spread and contract the distance between the opposing ends, and

(b) a tool support assembly having vertically adjustable support means attached to the upper clamping bar and having a plate attached to the support means and pressingly contactable to the drill in its operative position wherein a bushing support extends through the upper clamping bar and is provided with a hollow bushing fitable therein and through which passes a tool bit attached to the drill; and wherein

i. the upper clamping bar comprises an elongated metallic bar having at one end an upper jaw member provided with a convex lower surface and an opening through which the bushing support extends, and the upper clamping bar is provided with openings on its opposite sides and wherein a series of parallel passageways are drilled completely through the side of the lower clamping bar;

ii. the lower clamping bar comprises an elongated metallic bar having at one end a lower jaw member opposing the upper jaw member and provided with a convex upper surface; and

iii. the pivoting assembly comprises an upper positioning plate having side walls extending upward on either side of the upper clamping bar, the side walls being provided with side wall threaded openings aligned with the openings of the upper clamping bar; a lower positioning plate having side walls extending downward on either side of the lower clamping bar, the side walls of the



lower positioning plate being provided with side wall openings aligned with the parallel passageways of the lower clamping bar; attaching means for fixedly attaching the upper and lower positioning plates to one another; bolts of sufficient length to screw through the side wall threaded openings of the upper positioning plate and into openings of the upper clamping bar; and a pin of sufficient length to pass through the side wall openings of the lower positioning plate and one of the passageways of the lower clamping bar.

4,521,141

METHOD FOR CUTTING RACK TEETH

Michio Abe, Aichi, Japan, assignor to Tokai TRW & Co., Ltd., Kasugai, Japan

Division of Ser. No. 106,930, Dec. 26, 1979, abandoned. This application Jan. 19, 1983, Ser. No. 459,122

Claims priority, application Japan, Dec. 27, 1978, 53-162363

Int. Cl.³ B23F *15/00*

U.S. Cl. 409—48 **3 Claims**

1. In a method for cutting rack teeth having a varying pitch line in a rack-pinion steering gear of the type which comprises a pinion to be rotated by a steering wheel and a rotary rack bar movable in the axial direction and provided with rack teeth, the improvement comprising the steps of rotating and axially moving said rack along the varying pitch line of the rack teeth

so as to vary the indexed movement of the rack bar in the axial direction and linearly moving a hob cutter or gear shaper along

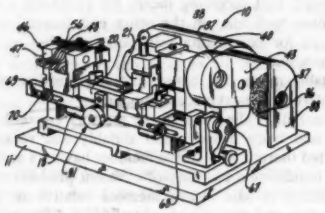
a line at an angle with respect to the axis of said rack bar to thereby form said rack teeth along said varying pitch line.

4,521,142

KEY CUTTING MACHINE

John Juskevic, Dearborn, Mich., assignor to Essential Automotive Products, Inc., Dearborn Heights, Mich.

Filed Aug. 30, 1982, Ser. No. 412,549
Int. Cl.³ B23C *1/16*
U.S. Cl. 409—82 **1 Claim**



1. A key duplicating machine for cutting a contoured edge on a key blank, comprising:

a base having a vertically arranged rigid support member;

a fixed shaft mounted upon the support member and extending horizontally above the base;

a fixture having a bracket extending from a platform portion toward the fixed shaft, with said bracket including an opening for journaling said fixed shaft, and said fixture being both pivotable and slideable upon the fixed shaft;

a key blank vise mounted upon a first end of the platform portion for temporarily clamping the key blank with an edge of the key blank being arranged parallel to said fixed shaft;

a rotating cutting wheel mounted upon the base for rotation about an axis parallel to the fixed shaft, said rotating cutting wheel being adapted to cut the edge of the key blank;

guide means mounted on a second end of the platform portion and a stylus mounted upon the base, and said guide means and stylus mounted for relative movement upon the platform portion and the base, with said guide means establishing a horizontal guide surface, and said stylus engaging the horizontal guide surface;

drive means for sliding said fixture relative to the fixed shaft, said drive means having means for interconnecting the fixture to the base to slide the fixture along the fixed shaft, with said means for interconnecting the fixture to the base permitting said fixture to pivot about said shaft, and wherein said drive means comprises an elongate bar mounted on the base for reciprocating horizontal movement and said means for interconnecting the fixture to the base comprises a vertically elongated slot in said elongate bar and a pin extending from the fixture into the vertically elongated slot, with said pin being moveable vertically in said vertically elongated slot, whereby said elongate bar positively engages said pin for horizontal reciprocating movement while said pin is moveable vertically to permit said fixture to pivot relative to the fixed shaft;

biasing means for urging said fixture pivotally relative to said fixed shaft causing the key blank and guide means to pivot toward the rotating cutting wheel and stylus respectively, and said biasing means comprising a spring which is mounted in a slot formed in an edge of said elongate bar with one end of said spring engaging a bottom surface of said fixture and with the other end of said spring engaging said slot, and adjustable cam means interengaging the elongated bar and the fixture for holding said fixture against the urging of the biasing means thereby separating the rotating cutting wheel from the key blank, and wherein the stylus engages the guide means and the rotating cutting wheel engages the key blank at spaced points at substantially equal radial distances from the fixed shaft, and said spaced points are substantially horizontally aligned on the platform portion in substantially the same radial direction relative to the fixed shaft;

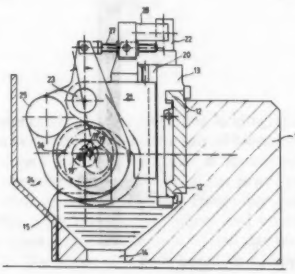
whereby the drive means slides the fixture horizontally relative to the shaft and the rotating cutting wheel respectively, while the biasing means urges the guide means and stylus into engagement with the stylus tracing the horizontal guide surface, thereby controlling the pivoting movement of the key blank toward and away from the rotating cutting wheel as it cuts the contoured edge upon the key blank.

4,521,143

CRANKSHAFT MILLING APPARATUS

Karlheinz Schmid, Neckartenzlingen, Fed. Rep. of Germany, assignor to Gerbrueder Heller Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 503,698
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1982, 3223285
Int. Cl.³ B23B *5/22*; B23C *3/06*
U.S. Cl. 409—200 **11 Claims**



1. A crankshaft milling apparatus, wherein a crankshaft is stationary during a milling operation, said crankshaft defining a horizontal longitudinal work piece axis, comprising a machine bed, at least one milling unit having inner milling cutter means for milling bearing pins and flanks of a crankshaft work piece, first slide means carrying said at least one milling unit, first guide means supported by said machine bed for guiding said first slide means in its movement in parallel to said work piece axis, carrier means for operatively securing said milling unit to said first slide means, said carrier means comprising

second slide means, second guide means on said first slide means for guiding said second slide means in its movement, pivot journal means having a journal axis spaced from said work piece axis and extending in parallel to said work piece axis, said pivot journal means being carried by said second slide means for securing said milling unit to said second slide means, whereby feed advance movements of said inner milling cutter means extend along a circular path around a crankshaft bearing pin to be milled, first feed advance means on said second slide means for rotating said milling unit along said circular path, said pivot journal means and said first feed advance means being arranged on said second slide means relative to said work piece axis, second feed advance means carried by said first slide means and operatively connected to said second slide means for moving said second slide means substantially in a plane extending perpendicularly to said work piece axis and substantially in parallel to a line connecting said journal axis of said pivot journal means and said work piece axis, said apparatus further comprising work piece chucking means supported on said machine bed, and wherein said milling unit and said carrier means for said milling unit have components which project in parallel to the direction of said work piece axis outside of said inner milling cutter means, said components being so arranged that they are located laterally of or above the adjacent chucking means, and wherein said first and second feed advance means cooperate in revolving said milling cutter means along said circular path around the crankpin to be milled.

4,521,144

QUILL STOP DEVICE

Carl A. Ginter, 3716 27th Ave. S., Minneapolis, Minn. 55406

Filed Aug. 2, 1983, Ser. No. 519,541

Int. Cl.³ B23Q *21/00*; F16B *37/10*

U.S. Cl. 409—218 **1 Claim**

1. A quill stop device, comprising, in combination, a shaft, a ring received on said shaft and a set screw received in said ring; said shaft having an external screw thread; said ring being made of resilient plastic material, said ring being circular and including an inwardly converging opening along its outer periphery, said opening having tangentical side walls to an inward end of said opening which has a screw thread snap-engagable with said screw thread of said shaft; and said ring having a slotted opening communicating with the first said opening inner end and forming pair of jaws on said ring, said set screw drawing said jaws together for quickly locking said ring on said shaft.

4,521,145

CUTTING OR DRILLING APPARATUS

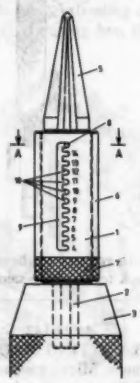
Hans Bieler, 7402 Bonaduz, Switzerland

Filed Sep. 19, 1983, Ser. No. 533,791

Claims priority, application Switzerland, Sep. 20, 1982, 5529/82

Int. Cl.³ B23B *49/00*; B23C *9/00*

U.S. Cl. 409—218 **8 Claims**



1. An apparatus for cutting or drilling a workpiece including:

an essentially cylindrical body member having, on one end thereof, tool receiving means for receiving a cutting or drilling tool and, on the other end thereof, connection means for connecting said body member to a driving means, and

adjustable means for controlling the position of the tool relative to a workpiece comprising

an essentially cylindrical sleeve member coaxially received on said body member and slidably and rotatably connected thereto, said sleeve member having a scale thereon for indicating a plurality of different predetermined axial positions of said sleeve member relative to said body member and tool which plurality of different predetermined axial positions define a plurality of positions of the tool relative to the workpiece, said sleeve member having a surface which is blocked by the workpiece from movement toward the workpiece and thus defines the position of the tool relative to the workpiece, and

locking means for locking said sleeve member in said plurality of different predetermined axial positions relative to said body member, said locking means comprising a pin radially extending from said body member, a slot arranged in the wall of said sleeve member and extending parallel to the axis of said sleeve and body members, and a plurality of recesses arranged side-by-side along a longitudinal edge of said slot, engagement of said pin with one of said plurality of recesses defining one of said plurality of different predetermined axial positions of said sleeve member relative to said body member.

4,521,146

LUG NUT CAP

Donald J. Wharton, Mishawaka, Ind., assignor to Maron Products, Inc., Mishawaka, Ind.

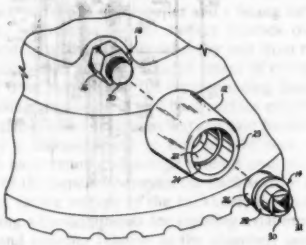
Filed Nov. 8, 1982, Ser. No. 439,772

Int. Cl.³ F16B *41/00*

U.S. Cl. 411—1 **1 Claim**

1. A protective cap for a wheel nut when threaded upon a lug, said cap comprising a skirt member defined by an outer annular wall terminating in outer and inner end edges and having an opening formed therethrough between the end

edges, said skirt member adapted to be placed about said nut with its said wall enclosing the nut and exposed end of the lug, said skirt member including an internal shoulder extending from said side wall into said opening, said skirt member shoulder being spaced from said outer end edge to form a recess about said exposed lug end, and a retainer member including socket means for receiving a tightening tool and a threaded portion adapted for engagement with said lug, said retainer member including a flange located between said socket means and said threaded portion, said retainer member flange adapted to adjacently overly said skirt member shoulder when said retainer member threaded part is turned onto said lug end with



said skirt member placed about said nut, said retainer member socket means including a wall part adapted to be located within said retainer member recess when said retainer member threaded portion is turned onto said lug, and said socket means wall part being yieldable wherein said socket means is stripped when said retainer member is fully turned onto said lug end with said tool rotating relative to the wall part whereby the retainer member is prevented from being further turned or loosened by the tool, said socket means wall part including individual wall members separated by slit means for allowing said wall members to flex away from said tool upon final tightening of said socket means onto said lug end.

4,521,147

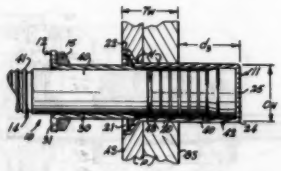
FLUSH HEAD BLIND FASTENER

John O. King, Jr., and John O. King, III, both of 3990 N. Ivy Rd., Atlanta, Ga. 30342

Continuation-in-part of Ser. No. 370,060, Apr. 20, 1982,. This application Jul. 12, 1982, Ser. No. 397,018

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—43 **15 Claims**



1. A fastener assembly adapted to attach workpieces together through aligned holes therein of an initial hole diameter having a countersink at one end of the holes comprising:

an outer sleeve member including an elongate tubular side wall and an annular head flange integral with one end of said side wall, said head flange having a size and shape adapted to fit in the countersink in the workpieces;

an inner sleeve member including an elongate tubular side wall and an annular head flange integral with one end of said side wall, said inner sleeve side wall having an outside diameter larger than the inside diameter of said outer sleeve side wall such that, when said inner sleeve member is driven into said outer sleeve member, said inner sleeve side wall will expand said outer sleeve side wall, and said inner sleeve head flange defining a trailing end surface thereon oriented normal to the central axis of said inner sleeve member;

a stem including a support selection thereon slidably extending through said inner sleeve member and having an outside diameter substantially equal to the inside diameter of said inner sleeve side wall to internally support said inner sleeve member while being driven into said outer sleeve member; and

deformable means operatively associated with said inner sleeve head flange and said outer sleeve head flange and adapted to be totally captivated between said inner sleeve head flange and said outer sleeve head flange, said deformable means deformed as an incident to the driving of said inner sleeve member into said outer sleeve member to expand said outer sleeve head flange.

4,521,148

HINGED MIRROR IMAGE PLASTIC FASTENER FOR QUICK ASSEMBLY TO THREADED MALE MEMBERS

Toshie Tanaka, Machida, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed May 6, 1983, Ser. No. 492,274

Int. Cl.³ F16B *13/06*

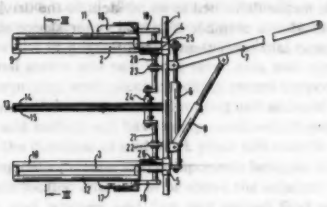
U.S. Cl. 411—182 **1 Claim**

1. a plastic fastener for panels, comprising in integral combination of a main body of the shape of a pair of hinged angular U-shaped pillars each possessed of a pair of spaced opposed side walls interconnected by base means at the lower one end and provided with an interconnecting flange-like head extended outwardly from the opposite upper end boundaries, resilient fitting means provided one each on said side walls and adapted to grasp the edges of a hole bored in a supporting panel in cooperation with the lower side of said head, and mutually opposed elastic tongues forming intermediate side walls positioned between said spaced opposed side walls substantially at right angles and extended from the lower side of said head and slanted toward the interior of the angular pillar of the main body, and said base means, said tongues being provided adjacent the free ends thereof with a plurality of female threads incised in arcuately depressed surfaces, said main body base means forming an imperforate hinged wall, said pair of pillars being adapted to abut with each other along a vertical plane and the halves of the main body being connected to each other through a transverse thin-wall hinge formed in said bottom wall.

4,521,149
BALE HANDLING MACHINE

John R. Redding, 19 Wellfield Rd., Piddington, High Wycombe, Buckinghamshire, and Patrick F. Hunter, Owlswick, both of England, assignors to John Robert Redding, High Wycombe, England

PCT No. PCT/GB82/00018, § 371 Date Sep. 27, 1982, § 102(e) Date Sep. 27, 1982, PCT Pub. No. WO82/02474, PCT Pub. Date Aug. 5, 1982
PCT Filed Jan. 25, 1982, Ser. No. 432,907
Claims priority, application United Kingdom, Jan. 26, 1981, 8102305; Sep. 14, 1981, 8127637
Int. Cl.³ A01D 87/12
U.S. Cl. 414—44 1 Claim



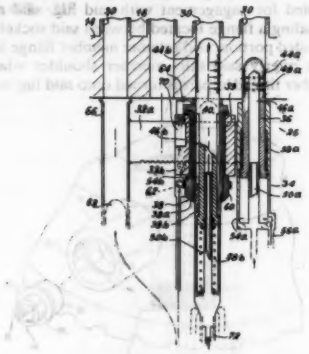
1. A bale handling machine comprising:
a generally U-shaped chassis frame having a pair of laterally spaced arms extending rearwardly from a forward cross-member to define a bale-receiving zone which is open from below and has an open rear end to receive a group of bales and closed forward end;
a tow bar extending forwardly from said cross-member and adapted for connection to a towing vehicle;
a pair of laterally spaced wheels supporting said frame above the ground for translational movement of the frame and movable relative to the frame to lower and raise the frame between a lowered bale-receiving position and a raised bale-transport position;
a pair of mutually horizontally opposed gripping elements mounted on respective arms of the frame, said gripping elements being relatively movable to grip and subsequently release bales located between them;
the said wheels being at the forward end of the frame and spaced rearwardly of the cross-member by a distance less than the length of the tow bar, and the vertical distance moved by the wheels relative to the frame being at least 14 inches and greater than the individual height of the bales which the machine is intended to handle, whereby the machine can place a transported bale onto a bale standing on the ground and subsequently raise and transport the resultant stack of bales.

4,521,150
DEVICE FOR POSITIONING A MEMBER FACING EACH OF THE PERFORATIONS OF A PERFORATED PLATE IN ACCORDANCE WITH A GIVEN GRID

Michel Pigeon, Bures sur Yvette, and Robert Saglio, Antony, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 2, 1982, Ser. No. 364,974
Claims priority, application France, Apr. 10, 1981, 81 07243
Int. Cl.³ B25J 5/00
U.S. Cl. 414—749 7 Claims

1. A device for positioning a member so as to face each of the perforations of a perforated plate in accordance with a given grid, comprising a body carrying at least two attachment members, means for displacing said members in a direction perpendicular to the plate and independently of one another, so that said members can be introduced into or removed from a facing perforation, means for fixing each of the attachment members into a perforation and means for displacing one of the members relative to another member, said device comprising a fastening finger including a first of said attachment members and a first part of said body carrying said first attachment member, said first part having a guidance surface on which is slidably fitted a second part of said body carrying the other of said attachment members, a semi-rigid guidance member connecting the fastening finger to a remote zone, and remote

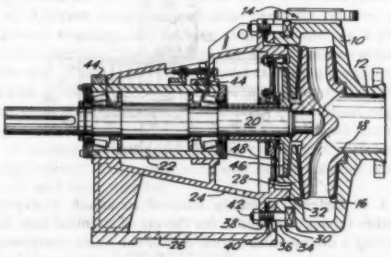


locking means normally fixing said second part of the body to the fastening finger when the second part of the body is fitted on said guidance surface, whereby said second part of the body carrying the other attachment members can be slid along said semi-rigid guidance member and on said guidance surface when said fastening finger has been fixed into a perforation.

4,521,151
CENTRIFUGAL SLURRY PUMP

John S. Frater, Carlisle, and David W. Pope, Sevenoaks, both of United Kingdom, assignors to Joy Manufacturing Holdings Limited, England

PCT No. PCT/GB81/00035, § 371 Date Nov. 4, 1981, § 102(e) Date Nov. 4, 1981, PCT Pub. No. WO81/02613, PCT Pub. Date Sep. 17, 1981
Continuation of Ser. No. 320,977, filed as PCT 81/00035, Mar. 4, 1981, published as WO 81/026/3, Sep. 17, 1981, § 102(e) date Nov. 4, 1981, abandoned. This PCT application Apr. 4, 1981, Ser. No. 545,106
Claims priority, application United Kingdom, Mar. 7, 1980, 8007912
Int. Cl.³ F04D 29/08
U.S. Cl. 415—131 6 Claims



1. A pump, comprising: a unitary generally C-shaped casing in which an inlet and an outlet are defined, a backliner supported at a rear portion of the casing, a pump chamber defined by the casing and the backliner, a rear housing adjacent said backliner, said backliner being axially movable with a first flange member affixed to said rear housing and arranged coaxially with said casing, said casing including an integral second flange member arranged coaxially of said first flange member,

said first and second flange members being releasably interconnected to said the backliner in position to establish the rear extent of said chamber, said first and second flange members being axially spaced by structure including removable shims interposed therebetween, an impeller disposed within the chamber and rotatable about an axis of the chamber, a rotatable drive shaft extending coaxially with said axis of the chamber, said impeller being carried by and fixed to said drive shaft for rotation and axial movement therewith, said impeller having a front surface and a back surface, and said impeller being disposed within the chamber such that a front running clearance is defined between a front surface of the impeller and a facing surface of the casing and a back running clearance is defined between a back surface of the impeller and a facing surface of the backliner, wherein said front surface extends over the entire radial extent of the impeller whereby said front running clearance extends over the entire radial extent of the impeller between said front surface and the corresponding facing surface of the casing, and wherein said back surface extends over the entire radial extent of the impeller and said backliner extends radially a distance equal to that of said back surface whereby said back running clearance extends over the entire radial extent of the impeller between the back surface and the corresponding facing surface of the backliner, the pump further comprising adjusting means for enabling axial movement of the shaft and impeller relative to the chamber, said shims and adjusting means enabling the axial extent of both said front and said back running clearances to be maintained at less than a predetermined maximum value, whereby increases in said running clearance due to wear and corrosion may be compensated for at the back surface of the impeller by movement of said shaft and impeller with respect to said backliner and at the front surface of said impeller by movement of the casing with respect to said backliner, rear housing and impeller so as to reduce the axial length and volume of the chamber.

4,521,152

APPARATUS FOR EXTRACTING AT LEAST THE INHERENT KINETIC ENERGY FROM WAVES

Stig A. Henrikson, 21, Fleminggatan, Stockholm S-112 26, Sweden

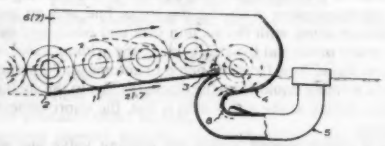
PCT No. PCT/SE82/00226, § 371 Date Feb. 15, 1983, § 102(e) Date Feb. 15, 1983, PCT Pub. No. WO83/00058, PCT Pub. Date Jan. 6, 1983

PCT Filed Jun. 21, 1982, Ser. No. 474,678

Claims priority, application United Kingdom, Jun. 25, 1981, 8119599

Int. Cl.³ F03B *13/12*

U.S. Cl. 415—2 R **7 Claims**



1. Apparatus for extracting inherent kinetic energy from water particles moving in substantially circular paths within waves, comprising a coherent plane extending continuously from an intake side to an outtake side for the passage of waves freely thereover, said plane being upwardly inclined toward said outtake side with an inclination not more than 1-to-7, and a duct including an entrance portion directed substantially beneath said plane toward said intake side, a wall of said entrance portion merging and forming a sharp angle with the edge of said plane at said outtake side, said entrance portion being configured to define a depression adjacent said edge of said plane so that waves passing over said edge fall into said depression, whereby said water particles are caused to be broken from their respective paths and to flow in substantially the same direction in said duct for delivery to associated energy converter means.

4,521,153

BLOWER AND ROTATING WIND DEFLECTOR

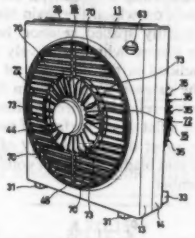
Masao Morimoto; Shoji Sano; Kazuyoshi Yoshimi, and Kazuo Saitou, all of Kasai, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Sep. 28, 1982, Ser. No. 426,203

Claims priority, application Japan, Feb. 17, 1982, 57-25126

Int. Cl.³ F01B *25/02*

U.S. Cl. 415—146 **16 Claims**



11. A blower comprising:

a body housing having front and rear openings;

a fan, mounted in said body housing, for generating a wind;

a rear guard mounted on said rear opening; and

wind deflector means mounted on said front opening and being freely rotatable therein, for receiving said wind and being rotated thereby, comprising an inner circumferential portion and an outer circumferential portion, at least said outer circumferential portion having a first vane being disposed in parallel, wherein at least a portion of said vane are plural vanes formed into an integral structure, and wherein said integral structure is borne between outer circumferential frames of said outer circumferential portion and said inner circumferential portion to be movable to an arbitrary angle with respect to said wind for changing the speed and/or direction of said wind deflector.

4,521,154

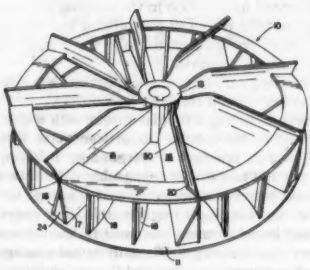
CENTRIFUGAL FANS

Reg D. Corbett, 30103 Clemens Rd., Westlake, Ohio 44145

Filed Jan. 13, 1982, Ser. No. 339,029

Int. Cl.³ F01D *5/14*

U.S. Cl. 416—175 **4 Claims**



1. A centrifugal fan comprising a centrally apertured circular metal base plate, a central hub secured to the upper surface of the base plate coaxially with the aperture, a plurality of

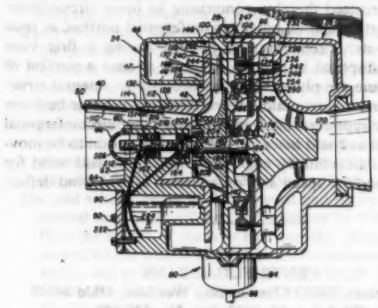
circumferentially spaced main blades mounted on one side of said base plate, each blade extending substantially radially with respect to said hub and comprising a pair of converging walls projecting from the upper surface of the base plate whereby each blade is of inverted V-shape in cross-section, one of the walls providing a leading surface and the other wall providing a trailing surface with respect to the intended direction of rotation of said fan, each blade having a blade extension extending upwardly from the line of convergence of said walls, one of said walls forming main blade portions and one of said walls forming an auxiliary blade support, said extension being curved forwardly with respect to the direction of rotation of said fan to form an elongated scoop along the distal edge of each blade, at least one relatively short blade of lesser height then said main blade being mounted on the outer peripheral side of the base plate on which the main blades are mounted and disposed in equally spaced relation between a pair of adjacent said main blades, which relatively short blade has a curved portion inclined in the direction of the curve of the leading edge of the extension of the main blade forming the scoop, and in which a relatively circular flat outer ring member is disposed over a flat upper surface of said relatively short blade forming the upper outer periphery of said fan and the inclined portion of said blade extends beyond the inner periphery of the ring member.

4,521,155

TURBOCHARGER COMPRESSOR HOUSING

Norbert L. Osborn, 402 W. Grauwyler, Irving, Tex. 75061

Continuation of Ser. No. 917,065, Jun. 19, 1978, abandoned.
This application Jun. 6, 1980, Ser. No. 157,196
Int. Cl.³ F04D *29/42*
U.S. Cl. 415—190 **9 Claims**



1. In a turbocharger having a compressor housing with an inlet port, a circumferential chamber surrounding said inlet port and leading to a compressor exhaust port, and a compressor rotor mounted for rotation in the housing for compressing air entering the inlet port and discharging the compressed air into the chamber for exhaust through the exhaust port, said compressor housing comprising:

an outer housing defining the inlet port and the circumferential chamber around the inlet port,

a wall insert including a tubular throat with a disc attached at one end of the tubular throat transverse thereto, said disc having an aperture corresponding to an opening in the throat and said throat engageable within the inlet port when said insert is mounted to said housing,

means for attaching said insert within said outer housing with said insert forming one wall of the circumferential chamber and forming a circumferential passageway between the compressor rotor and the circumferential chamber for channeling compressed air from the rotor to the chamber, wherein said attachment means comprises rivet protrusions integrally formed and extending from the disc and corresponding to and facing apertures in the wall of the outer housing circumferentially spaced around the inlet port, said rivet protrusions adapted for insertion into said apertures to join said insert to said outer housing,

said inlet port having an inside surface with a first portion remote from said wall insert having a varying diameter converging toward the compressor rotor,

a second portion adjacent the compressor rotor diverging in diameter toward the compressor rotor, and

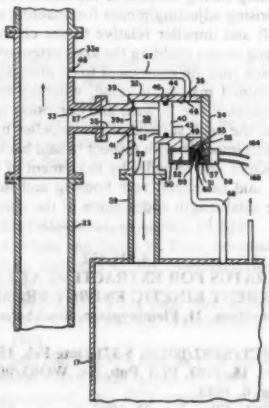
wherein the tubular throat of said insert has an inside surface converging in diameter toward the disc and an outside surface diverging in diameter toward the disc to mate with the diverging inside surface of the inlet port of said outer housing.

4,521,156

SELF-PRIMING PUMP SYSTEM HAVING DIAPHRAGM-TYPE FLOW SENSOR

Pellegrino E. Napolitano, Middletown, N.J., assignor to Hudson Engineering Company, Bayonne, N.J.

Filed Dec. 16, 1982, Ser. No. 450,366
Int. Cl.³ F01B *25/00*
U.S. Cl. 415—11 **11 Claims**



1. In a self-priming pump system including a liquid pump, a suction tank in communication with the pump, a discharge line connected to the pump and including a check valve positioned downstream of the pump a distance sufficient to provide a column of priming liquid, and a priming valve having an inlet in communication with the discharge line and an outlet in communication with the suction tank and positioned between the pump outlet and the check valve, the priming valve responsive to liquid flow from the pump to automatically permit flow of the priming liquid from the discharge line to the suction tank when suction at the pump inlet is lost, the improvement comprising:

a. a piston housed within the priming valve and slidably positioned within a cylinder, one face of said piston directly exposed to the liquid in the discharge line at the discharge line static pressure, and the other face of said piston exposed to the liquid in the discharge line at the discharge line static pressure via the priming valve, the area of said one face of said piston being greater than the area of said other face to maintain the priming valve in a closed condition;

b. a conduit connecting the one face of said piston to the suction tank;

c. a pilot valve blocking said conduit; and

d. flow sensing means to sense liquid flow through the pump and operatively connected with said pilot valve to cause it to open under a given flow condition to relieve the pres-

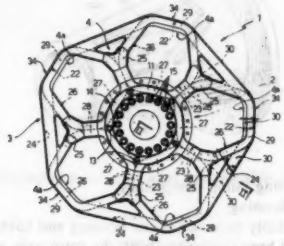
sure on the one face of said piston to cause the priming valve to open responsive to the given flow condition.

4,521,157

HELICOPTER ROTOR HUB

Vittorio Caramaschi, Gallarate, and Pier L. Castelli, Busto Arsizio, both of Italy, assignors to Costruzioni Aeronautiche Giovanni Agusta S.p.A., Italy

Filed Mar. 2, 1983, Ser. No. 471,343
Claims priority, application Italy, Mar. 11, 1982, 67302 A/82
Int. Cl.³ B64C *11/06*
U.S. Cl. 416—134 A 6 Claims



1. A helicopter rotor hub of plate-like plan form having a plurality of apertures (*4a*) uniformly distributed about a central axis and each closed radially outwardly by a respective bridge (34) extending peripherally of the said plate permitting the connection of a respective blade to the plate, characterised by the fact that it includes an inner support structure (2) coaxial with the said axis, an outer annular frame (3) extending along the said bridges (34), and an intermediate lobe structure (4) rigidly connected both to the said inner structure (2) and to the said outer frame (3); the said intermediate structure including a plurality of annular elements (26) each of which comprises an annular band of oriented synthetic fibres and having a portion (29) extending along a respective said bridge (34) and a further portion (27) connected to the said inner structure (2).

4,521,158

FLUID-FLOW MACHINE

Kurt G. Fickelscher, Frankenthal, Fed. Rep. of Germany, assignor to Balcke-Duerr AG, Ratingen, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,225
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1982, 3233078
Int. Cl.³ F03B *3/14*
U.S. Cl. 416—160 18 Claims

1. A fluid-flow machine comprising:

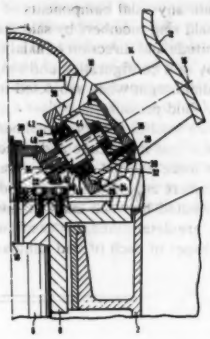
a hub rotatable about an axis,

a bearing support member fixed to said hub for rotation therewith,

a plurality of blade members mounted on said bearing support member and distributed symmetrically around said hub axis, each of said blade members having a blade-root which is pivotably received in an open-ended housing formed in said bearing support member, and

adjusting means for pivoting said blade-roots and blades about a blade-root axis to adjust the angle of the blade, said adjusting means comprising for each housing and blade-root member a reduction gear drive shaft and a self-locking reduction gear drivingly interposed between the drive shaft and the blade-root,

each said reduction gear drive shaft being rotatably mounted in a bearing supported on the associated blade-root for rotation relative to said blade-root about an axis parallel to said blade-root axis, and said reduction gear drive shaft



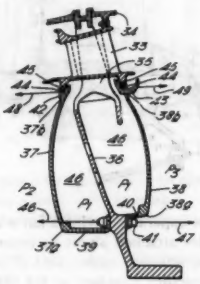
being rotatable by turning of an adjusting shaft which drives a gear wheel fixed to the drive shaft.

4,521,159

LOAD DISTRIBUTION MEMBER

George Pask, Derby, England, assignor to Rolls-Royce Limited, London, England

Filed May 20, 1983, Ser. No. 496,669
Claims priority, application United Kingdom, Jun. 10, 1982, 8216915
Int. Cl.³ F01D *11/00*
U.S. Cl. 416—174 5 Claims



1. Two load distribution members defining a chamber therebetween, said chamber being operationally interposed between regions of high and low fluid pressure, said chamber further having an interior containing fluid at a pressure which is higher than that of fluid in said regions of high and low fluid pressure, each of said load distribution members comprising:

an annular diaphragm having an inner circular edge and an outer circular edge of greater diameter, said diaphragm having a configuration when interposed between and subjected to said regions of high and low fluid pressure of a general shape of a part-toroid of a complete thin shelled toroid having a circular cross-section area of revolution, said part-toroid having an axis co-axial with axes of said inner circular edge and said outer circular edge;

first and second ring members respectively engaging said inner circular edge and said outer circular edge to provide radial restraint of said inner circular edge and said outer circular edge so that radial components of forces exerted upon said ring members by said diaphragm as a result of fluid pressure difference between said regions of high and

low pressure fluid pressure are absorbed by said ring members as hoop stresses;

support means attached to at least one of said ring members to contain any axial components of force of said at least one of said ring members by said diaphragm, distribution of magnitude and direction of axial forces being predetermined by said configuration and shape of said part-toroid of said diaphragm when subjected to said regions of high and low fluid pressure;

and said two load distribution members having an arrangement such that magnitude and direction of axial components of force exerted upon said support means by said ring members engaging each of said annular diaphragms are distributed between each of said ring members in a manner pre-determined by configurations of the part-toroid shapes of each of said annular diaphragms.

4,521,160

ROTORS OF ROTATING MACHINES

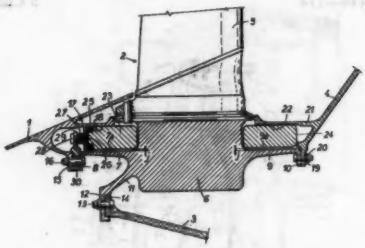
Jean G. Bouiller, Brunoy, and Marcel R. Soligny, Chevilly-Larue, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, France

Continuation of Ser. No. 358,865, Mar. 17, 1982, abandoned, which is a continuation of Ser. No. 116,528, Feb. 1, 1980, abandoned. This application Sep. 8, 1983, Ser. No. 529,938

Claims priority, application France, Feb. 8, 1979, 79 03191

Int. Cl.³ F01D *5/06*

U.S. Cl. 416—218 **13 Claims**



1. In a turbine apparatus having a fan wheel with a plurality of turbine blades attached about its outer periphery, an upstream structure attached to one side of the fan wheel and a downstream structure attached to the other side of the fan wheel, the improved device for containing fragments of the fan wheel in case of bursting comprising: (a) a first annular extension formed on the one side of the fan wheel defining a first external cylindrical surface; (b) a second annular extension formed on the other side of the fan wheel defining a second external cylindrical surface; (c) a first containment ring having high tensile strength in the circumferential direction disposed coaxially about the first annular extension, the first containment ring being disposed radially outwardly of the first external cylindrical surface so as to define a circumferentially open space therebetween; (d) first means to attach the first containment ring and the fan wheel to the upstream structure to prevent relative rotation therebetween; (e) a second containment ring having high tensile strength in the circumferential direction disposed coaxially about the second annular extension, the second containment ring being disposed radially outwardly of the second external cylindrical surface so as to define a circumferentially open space therebetween; and (f) second means to attach the second containment ring and the fan wheel to the downstream structure to prevent relative rotation therebetween.

4,521,161

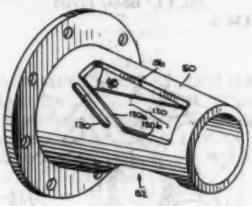
NOISE CONTROL FOR CONICALLY PORTED LIQUID RING PUMPS

Ole B. Olsen, Newtown; Charles W. Bilik, Norwalk; Herbert H. Johnson, Georgetown, and Charles M. Jozepaitis, Bridgeport, all of Conn., assignors to The Nash Engineering Company, Norwalk, Conn.

Filed Dec. 23, 1983, Ser. No. 564,881

Int. Cl.³ F04C *19/00*

U.S. Cl. 417—68 **7 Claims**



1. A liquid ring pump comprising:

an annular housing;

a rotor rotatably mounted in the housing and having a frusto-conical bore concentric with the rotor axis; and

a frusto-conical port member disposed in the bore and fixedly mounted relative to the housing, the port member including (1) an intake port, (2) a first discharge port located beyond the intake port in the direction of rotor rotation and having a closing edge including a segment which is inclined in the direction of rotor rotation from a first relatively large diameter circumference portion of the port member to a second relatively small diameter circumference portion of the port member, the first and second circumference portions being axially spaced from one another along the rotor axis, and (3) a second discharge port spaced from the first discharge port and located beyond the inclined closing edge segment but before the intake port in the direction of rotor rotation, the second discharge port being a longitudinal slot substantially parallel to the inclined closing edge segment.

4,521,162

PUMPING SYSTEM

Francis J. Parkinson, Warrington, England, assignor to British Nuclear Fuels plc, Warrington, England

Filed May 7, 1984, Ser. No. 607,448

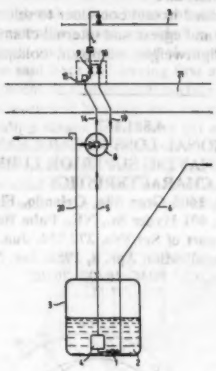
Claims priority, application United Kingdom, May 24, 1983, 8314320

Int. Cl.³ F04F *1/02, 1/14;* F04B *23/14*

U.S. Cl. 417—138 **4 Claims**

1. A fluidic pumping system comprising a vessel for a liquid to be pumped, a reverse flow diverter positioned at a level below the level of the liquid to be pumped, a charge vessel and a delivery pipe with the reverse flow diverter inserted therebetween, compressed gas supply means for the charge vessel and control means for effecting alternate pressurising and venting of the charge vessel to effect pumping of the liquid, the control

means including a conduit communicating with the charge vessel and means for generating signals along the conduit for



detecting the liquid level at at least one position in the operating cycle.

4,521,163

OSCILLATING DISPLACEMENT PUMP

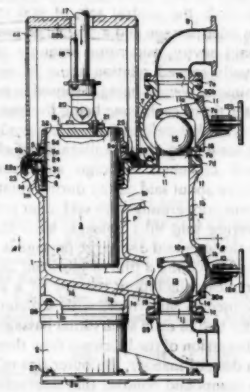
Friedrich R. R. Stahlkopf, Büchen, Fed. Rep. of Germany, assignor to O.T. Pumpen GmbH & Co. KG, Fed. Rep. of Germany

Filed Jun. 23, 1983, Ser. No. 506,903

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1983, 8312806[U]

Int. Cl.³ F04B *31/02, 15/02;* **F16J** *15/18*

U.S. Cl. 417—238 **22 Claims**



1. An oscillating displacement pump, particularly for pumping a liquid medium which is viscous and abrasive or loaded with solid particles, said pump being preferably equipped with a piston drive acted upon by a hydraulic pressure medium and driving a displacement unit having the form of a plunger piston (3), the stroke and/or stroke frequency of which piston drive is constant or variable, which displacement pump has a connecting space (K), which connects a suction valve space (S) with a pressure valve space (D) in such a way that the connection is preferably straight lined and direct, which connecting space (K) is located outside of the displacement unit space (P) and is traversed by the pumped medium in such a way that the geodetic height of the medium increases; and two connecting channels (1*g*, 1*h*) which, independent of the position of the displacement unit (3), at any given time, are connected with each other through the displacement unit space (P) and in which a suction valve side connecting channel (1*g*) connects the displacement space (P) on one hand in the area of a housing floor (1*a*) and by way of a downward incline with the suction valve side end of the connecting space (K) and a pressure valve side connecting channel (1*h*) connects the displacement unit space (P) on the other hand by way of an upward incline with the pressure valve side end of the connecting space (K), said pump further including a sealing housing (4 or 4*a*), a pressure sleeve 5 or 5*a*), a sealing element (6 or 6*a*) structurally adapted to a diameter (ϕ D, ϕ d) of said plunger piston (3), and a recess (5*d*) formed over the entire inner bore circumference of the pressure sleeve (5 or 5*a*), said recess forming, in conjunction with the plunger piston (3), an annular chamber (5*e*) provided with opposing connection openings (5*c*).

4,521,164

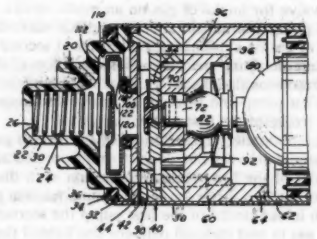
ROTARY FUEL PUMP WITH PULSE MODULATION

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Jan. 23, 1984, Ser. No. 573,285

Int. Cl.³ F04B *39/02, 39/08;* **F16L** *55/04*

U.S. Cl. 417—307 **2 Claims**



1. In a rotary fuel pump which includes an elongate housing on a main axis having a main inlet housing at one end and a main outlet housing at the other end, that improvement which comprises:

(a) a rotary pump adjacent the main inlet housing rotating on said main axis,

(b) an electric motor to drive said pump positioned between said pump and said main outlet,

(c) a centrally apertured disc adjacent said pump disposed in a plane transverse to said main axis,

(d) means forming a secondary pump outlet opening to space between said pump and said disc,

(e) an inlet chamber formed in said main inlet housing having one end open to said disc,

(f) a damper relief valve disposed in said inlet chamber comprising a damper chamber formed of flexible material having a first wall fully enclosing said damper chamber and a second wall spaced from said first wall and annularly sealed thereto, said second wall having an opening communicating with the central opening in said disc and open to said secondary pump outlet, and

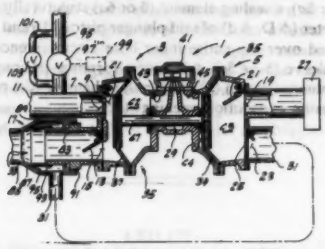
(g) a compression spring positioned in said inlet chamber to bear axially against said first wall, said second wall being sealed against said disc, said damper chamber being movable by pressure in said secondary pump outlet against said spring to relieve pump outlet pressure to said main inlet through the aperture in said disc.

4,521,165

APPARATUS FOR PUMPING FLUENT SOLID MATERIAL

Avrom R. Handleman, Webster Groves, Mo., assignor to Semi-Bulk Systems, Inc., Overland, Mo.

Filed Aug. 31, 1984, Ser. No. 646,011
Int. Cl.³ B65G *53/08*; F04B *15/02, 43/06*
U.S. Cl. 417—393 **14 Claims**



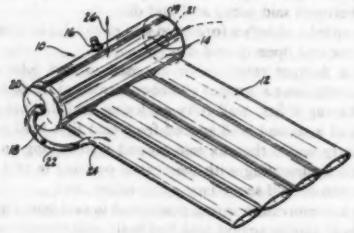
1. Apparatus for pumping fluent solid material comprising:
a first expansible chamber pump having an inlet with a check valve for intake of material from a supply thereof on an intake stroke of said first pump and an outlet with a check valve for discharge of the material on a discharge stroke of said first pump;
a line for delivery of material from the outlet of said first pump;
a second expansible chamber pump having an inlet with a check valve for intake of gas on an intake stroke of said second pump and an outlet with a check valve for discharge of gas on a discharge stroke of said second pump;
means interconnecting the pumps for operation of the second pump through a discharge stroke on an intake stroke of the first pump and through an intake stroke on a discharge stroke of the first pump; and
a gas line interconnecting the outlet of the second pump to said material delivery line downstream from and adjacent the outlet of the first pump whereby on each discharge stroke of the first pump the second pump takes in gas and on each intake stroke of the first pump the second pump pumps gas to said material delivery line behind the material delivered into said line through the outlet of said first pump on the preceding stroke of said first pump.

4,521,166

INFLATABLE AIR PUMP

William E. Phillips, 6015 Varna Ave., Van Nuys, Calif. 91401

Continuation-in-part of Ser. No. 317,436, Nov. 2, 1981, abandoned. This application Apr. 28, 1982, Ser. No. 372,639
Int. Cl.³ F04B *43/08, 45/06*; A47C *27/08*
U.S. Cl. 417—478 **26 Claims**



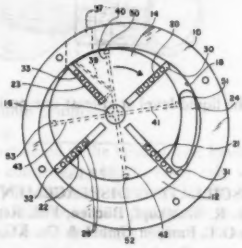
1. An inflatable pump comprising:
a plurality of inflated chambers collectively and substantially exclusively defining a completely enclosed internal chamber, said plurality of inflated chambers collectively and substantially exclusively forming a self-supporting, resilient container; and
valve means disposed in said container to selectively permit fluid to ingress and egress said internal chamber; whereby an extremely lightweight, compact, collapsible pump is devised.

4,521,167

LOW FRICTIONAL LOSS ROTARY VANE GAS COMPRESSOR HAVING SUPERIOR LUBRICATION CHARACTERISTICS

Robert J. Cavalleri, 1605 Gran Via, Orlando, Fla. 32825, and William E. Clark, 401 Hyder St., NE., Palm Bay, Fla. 32907

Continuation-in-part of Ser. No. 272,754, Jun. 11, 1981, abandoned. This application Apr. 8, 1983, Ser. No. 483,178
Int. Cl.³ F04C *18/00, 29/02*
U.S. Cl. 418—82 **9 Claims**



1. A low frictional loss, rotary vane gas compressor utilizing a housing having a generally elliptical cavity therein, and a rotor disposed in said cavity, with the axis of rotation of said rotor being offset from the central axis of said cavity, said housing having an inlet passage and a discharge passage, each in contact with said cavity, said rotor having a plurality of radial slots in equally spaced relation about its periphery, a slidable vane of minimal weight being disposed in each of said slots, with the outer tip of each vane being in close proximity to an inner stator wall that defines the outer boundary of said cavity, said vanes serving to define a plurality of chambers in said cavity, which chambers undergo significant volume changes as they move about said cavity during rotation of said rotor, said vanes thus cooperating with said inner stator wall to compress gas entering said inlet passage, such that the gas thereafter leaving through said discharge passage is at a higher pressure, means for providing a film of lubricant on said inner stator wall, latter means including the use of a plurality of radial passages defined in said rotor, with a metering nozzle located on the outer end of each such radial passage, such that the quantity and dispersion of the lubricant flow therefrom will be controlled in a desired manner, the outer tips of said vanes each possessing a compound contour that interacts with such film of lubricant to effect a good seal with said inner stator wall, while minimizing friction.

4,521,168

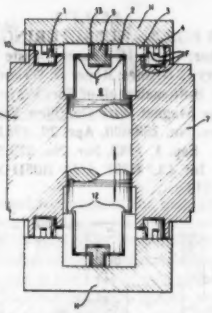
SEALING MEANS FOR A ROTARY PISTON ENGINE

Peter B. Kathmann, Hamburg, Fed. Rep. of Germany, assignor to RMC Rotary Motor Company AG, Zug, Switzerland

Continuation of Ser. No. 101,222, Dec. 7, 1979, abandoned. This application Aug. 30, 1982, Ser. No. 413,072
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1978, 2853423
Int. Cl.³ F01C *19/04, 19/08*
U.S. Cl. 418—137 **7 Claims**

1. In a rotary piston engine, the combination of a housing

having a cylindrical internal surface; a rotor mounted in said housing for rotation about an axis which is parallel to the axis of said internal surface, said rotor having first and second end portions, a peripheral surface between said end portions and a diametrically extending bore provided in said peripheral surface between said end portions; and elongated body reciprocably installed in said bore and having first and second end portions each adjacent to said internal surface; and sealing means interposed between said housing, said rotor and said elongated body, said sealing means comprising (a) annular first sealing elements surrounding said peripheral surface at the opposite sides of said bore, sealingly engaging said housing adjacent to the respective axial ends of said internal surface and arranged to rotate with said rotor, (b) substantially U-shaped second



sealing elements each having a central portion interposed between one end portion of said elongated body and said internal surface and two outer portions extending in substantial parallelism with the axis of said bore at the opposite sides of said elongated body, said second sealing elements being arranged to rotate with said rotor as well as to reciprocate with said elongated body with reference to said rotor, and (c) third sealing elements extending between sealingly engaging said first sealing elements and the outer portions of said second sealing elements and arranged to rotate with said rotor, said outer portions of said second sealing elements being arranged to slide relative to the respective third sealing elements in response to reciprocation of said elongated body in said bore as a result of rotation of said rotor with reference to said housing.

4,521,169

VANE PUMP WITH INTERMEDIATE ROTARY CASING AND DRIVE CLUTCH

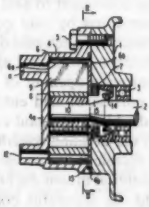
Hitoshi Ogawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1984, Ser. No. 594,133

Claims priority, application Japan, Mar. 31, 1983, 58-49053[U]

Int. Cl.³ F04C *18/348*

U.S. Cl. 418—69 **6 Claims**



1. A vane type pump, comprising:

(a) a frame member (1),

(b) a housing (4) having a cylindrical inner surface and secured to said frame member,

(c) a rotor (8) eccentrically disposed in said housing with respect to a center thereof,

(d) a drive shaft (2) rotatably supported by the frame member and disposed concentrically within said rotor,

(e) means for operatively coupling said shaft to said rotor, said coupling means comprising a one-way clutch (10) disposed between said shaft and said rotor for connecting the rotor to the shaft when the rotational speed of said shaft is higher than a predetermined value, and for releasing the rotor from the shaft when the rotational speed of said shaft is lower than the predetermined value,

(f) a plurality of radial slots (8*a*) formed in a peripheral surface of said rotor,

(g) a plurality of vanes (9) slidably disposed in said slots, said vanes being centrifugally extended from said slots by the rotation of said rotor,

(h) an intermediate casing (6) rotatably disposed between said housing and said rotor and having a cylindrical inner surface (6*a*) with which outer ends of said vanes are slidably engaged upon centrifugal extension, and

(i) an inlet port (11) and an outlet port (12) of said pump communicating with a space between said rotor and said casing, whereby the frictional drag of the vane ends along the inner surface of the casing rotates the casing to thereby reduce the degree of sliding between the vane ends and the casing and attendantly the wear of the vane ends.

4,521,170

POWER SEMICONDUCTOR COMPONENT FOR LIQUID COOLING

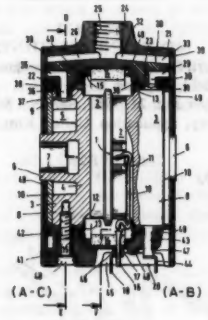
Erwin Klein, Heddesheim, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie. AG, Mannheim-Kaefertal, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,832

Claims priority, application European Pat. Off., Sep. 19, 1981, 81107465

Int. Cl.³ H01L *23/34, 23/46*

U.S. Cl. 357—81 **10 Claims**



1. Power semiconductor component for liquid cooling, comprising a semiconductor crystal disc having at least one pn-junction and two main electrodes; two thermally and electrically conducting multicontacts each being connected to a respective one of said main electrodes; cooling capsules each including a wall, a bottom and a cover defining an interior space, and cooling rods disposed on said bottoms in said interior space, said bottoms being in the form of thermally and electrically conducting heat sink discs each being connected to a respective one of said multicontacts, said cooling capsules having openings formed therein for receiving and discharging

coolant, and said covers having electrical connecting eyes formed thereon; an inner liquid-tight housing surrounding said semiconductor crystal disc including a ceramic ring, additional ring-shaped parts and said heat sink discs; and an outer insulating housing including two ceramic half-shells having hydraulic connecting eyes formed thereon with holes formed therein, and a multibranch canal system for conducting coolant through said interior space and around said interior liquid-tight housing between said holes formed in said hydraulic connecting eyes and said openings formed in said cooling capsules.

4,521,171

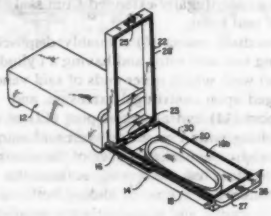
FOOT PATTERN DEVICE

David Noonan, Jr., 227 Linden St., Manchester, N.H. 03104

Filed Mar. 28, 1984, Ser. No. 594,322

Int. Cl.³ B29C *17/00*

U.S. Cl. 425—2 **5 Claims**



1. A foot pattern device comprising:

a cavity having a base and a wall portion;

a foot form in said cavity on said base;

a frame releasably securable to said base for gripping a deformable sheet between the lower edge of said frame and the upper portion of said wall portion;

means for heating said deformable sheet; and

clamp means for holding said frame tightly to said wall portion with said deformable sheet between them as a foot is pressed on said warmed deformable sheet into said foot form.

4,521,172

MOULDING MACHINES

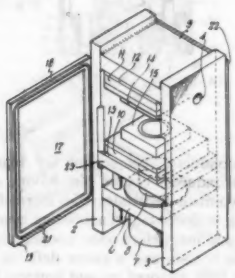
Barrie W. Gilbert, Stonnall, England, assignor to Bipel Limited, Sutton Coldfield, England

Filed Jun. 21, 1983, Ser. No. 506,473

Claims priority, application United Kingdom, Jul. 3, 1982, 8219310

Int. Cl.³ B29C *3/00*

U.S. Cl. 425—73 **10 Claims**



1. A compression moulding press having an external supporting frame in the form of a box constituted by two said walls defining press sidewall tension members and spaced apart by an integral press top member coextensive with the side walls and a bottom table member reaction surface coextensive with the side walls, and a back member between the press top member, the bottom table member and the two side members to define therebetween a moulding area for the press accessible from outside the press through an aperture defined between edge portions of said side walls and members, together with door means co-operable with said edge portions to close said aperture to create a closed chamber from and integral with said external supporting frame, whereby said side walls, press top member, bottom table member, back member and door means defined a sealed space including said moulding area which can be at least partly evacuated.

4,521,173

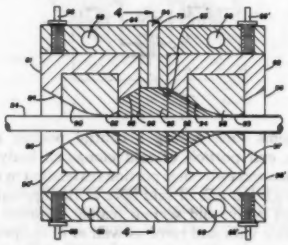
APPARATUS FOR MANUFACTURING MAGNET WIRE

G. Daniel Hilker; Verne H. Lausen; Jessie H. Coon; James E. Bodette; Jerry L. Grimes; Roger D. Wright; Donny R. Disque, and Keith D. Bultemeier, all of Fort Wayne, Ind., assignors to Phelps Dodge Magnet Wire Co., New York, N.Y.

Division of Ser. No. 258,690, Apr. 29, 1981,. This application Sep. 1, 1983, Ser. No. 528,564

Int. Cl.³ B29F *3/10*; B05D *5/12*

U.S. Cl. 425—113 **14 Claims**



1. An apparatus for the manufacture of coated filaments such as magnet wire comprising a die apparatus, a filament pay-out device, a coated filament take-up device, said die apparatus being positioned between said pay-out and take-up devices to receive a moving filament trained from said pay-out device to said take-up device, said die apparatus including an entrance die and exit die and a die block, said die block being between said dies, said entrance die having an entrance opening and an exit opening, said entrance die having a throat portion and a diverging interior wall portion, said throat portion being smaller than said exit opening, said throat portion being larger than said filament, said throat portion being connected to said entrance opening, said throat portion being connected by said diverging interior wall portion to said exit opening, said exit die having an entrance opening and an exit opening, said exit die having a throat portion and a converging interior wall portion, said throat portion being smaller than said entrance opening, said throat portion being larger than said filament, said throat portion being connected to said exit opening, said throat portion being connected by said converging interior wall portion to said entrance opening, said die block having an interior passage communicating with said exit opening of said entrance die and said entrance opening of said exit die, said diverging interior wall portion of said entrance die and said interior passage of said die block and said converging interior wall portion of said exit die defining together a die chamber, said die chamber being fillable with flowable but hardenable material, said flowable material in said die chamber supporting said filament within said die apparatus concentricly of said throat portion of said exit die, a reservoir of said flowable material, operatively connected to said die apparatus for filling said central die chamber with said flowable material, said

reservoir maintaining said flowable material within said die chamber at elevated pressures.

4,521,174

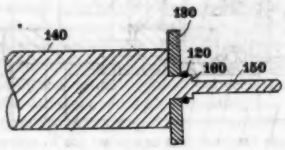
ADJUSTABLE DOUGH MANIPULATOR

Murray Kornhauser, 620 Argyle Rd., Wynnewood, Pa. 19096

Continuation of Ser. No. 419,132, Sep. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 279,226, Jun. 30, 1981, abandoned. This application Feb. 23, 1984, Ser. No. 582,807

Int. Cl.³ A21C *1/08*

U.S. Cl. 425—194 **1 Claim**



1. A dough manipulator adapted for manually controlling the thickness of dough comprising a roller with handles, and means for maintaining said roller at a predetermined height above a substantially flat surface, said means consisting of two spacer rings positioned at the ends of said roller;

said means for maintaining each spacer ring in position consisting of an elastic member seated in a groove at a predetermined distance from the end of said roller.

4,521,175

APPARATUS FOR PRODUCING CONTAINERS FROM THERMOPLASTIC SHEET MATERIAL

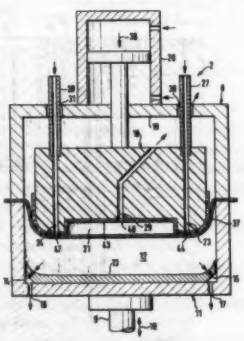
Emmerich Medwed, Wolfertschwenden, Fed. Rep. of Germany, assignor to Multivac Sepp Haggenmuller KG, Wolfertschwenden, Fed. Rep. of Germany

Division of Ser. No. 242,356, Mar. 10, 1981, Pat. No. 4,397,804. This application Feb. 22, 1983, Ser. No. 468,371

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 8007086[U]

Int. Cl.³ B29C *17/04*

U.S. Cl. 425—403 **12 Claims**



1. A device for producing containers from thermoplastic sheet material comprising a molding die having a projecting peripheral portion and/or a recessed central portion directed, in use, towards said sheet material, said molding die being provided with a plurality of first bores adjacent said peripheral portion and a second bore displaced from said first bores in a direction towards the center of said central portion, said second bore forming a venting bore connected with the environment, a cooling air source and means for connecting said cooling air source with said first bores, whereby in use a stream of cooling air flow is directed against said thermoplastic sheet material from a region thereof adjacent to said peripheral portion directed to the inner region of said central portion and vented through said second bore to cool said sheet material progressively from said regions thereof adjacent said peripheral portions towards said central portion.

4,521,176

SHOE UPPER CAVITY SHELL

George J. Bouzianis, Ipswich, and Donald B. McIlvin, Danvers, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Sep. 28, 1984, Ser. No. 656,076

Int. Cl.³ B29F *1/00*; B29D *27/00*

U.S. Cl. 425—521 **9 Claims**

1. In a mold apparatus for a shoe resin applying machine in which a shoe upper has a resin ejected into a heel pocket between an inner layer and an outer layer of that upper having a male mold apparatus which is caused to press the treated upper into a female mold, wherein the improvement comprises:

a shell mold matable over the distal portion of said male mold apparatus and arranged to correspond to the configuration of the shoe upper being worked upon.

4,521,177

MULTIPLE INJECTION MOULDING APPARATUS

Michael G. Blank, Wuppertal, and Horst E. Hammerschmidt, Hattingen, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Koppern FmbH & Co. KG, Hattingen, Fed. Rep. of Germany

Continuation of Ser. No. 433,450, Oct. 8, 1982, abandoned. This application Apr. 5, 1984, Ser. No. 597,551

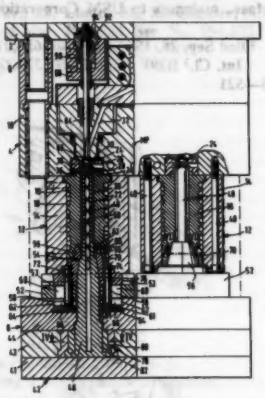
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1981, 3140711; Jul. 31, 1982, 3238743

Int. Cl.³ B29C *1/00*; B29F *1/022*

U.S. Cl. 425—533 **9 Claims**

1. A multiple injection mould for preforms provided with a bottle neck socket, said preforms having application for the manufacture of bottles by a blast method, the mould including a fixed plate on the nozzle side of the injection moulding machine; a plurality of outer moulds, each of which defines a substantially cylindrical outer section of a preform; a plurality of mould elements recessed into the fixed plate, said mould elements defining the mould contour which forms the base of the preform, each of said mould elements also including a filling channel; a core-carrying plate movable within the injection moulding machine on to which there are fixed a plurality

of cores which respectively engage said outer moulds; pairs of mould end plates movable at right angles to the axis of said outer moulds, said mould end plates having an internal contour dimensioned for moulding the socket of the bottle neck; an intermediate plate on which said mould end plates are mounted and which is adjustable relative to said core carrying plate in order to withdraw said cores out of the preforms; a plurality of inner housings in each of which one of said outer moulds is formed; a plurality of separate external housings which respectively enclose said inner housings, each of said external housings being secured to said fixed plate; a separate pair of said mould end plates being assigned to each of said outer moulds;



each pair of mould end plates having an outer frusto-conical surface, said outer moulds having internal frusto-conical surfaces which respectively cooperate with said outer frusto-conical end plate surfaces, each of said mould end plates also including an inner frusto-conical surface which is coaxial with the socket of the bottle neck formed by the preform, said mould end plates acting, respectively, in conjunction with outer frusto-conical surfaces on said cores; a plurality of separate guides, each extending at right angles to the direction in which the injection mould opens, each pair of said mould end plates being mounted in said guides; and a common hydraulic drive for a plurality of adjacent pairs of said mould end plates to open and close the pairs of said mould end plates.

4,521,178

APPARATUS FOR PRODUCING UNDERCUT TUBULAR SYNTHETIC PLASTIC ARTICLES

Anton Anger, Linz, Austria, assignor to Österreichische Schiffswerften Aktiengellschaft Linz-Korneuburg, Linz-Korneuburg, Austria

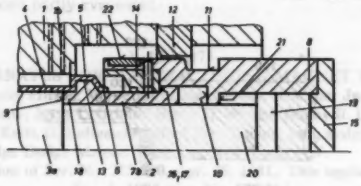
Continuation of Ser. No. 157,684, Jun. 9, 1980, abandoned, which is a continuation of Ser. No. 956,782, Nov. 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 707,628, Jul. 22, 1976, Pat. No. 4,127,632. This application Jul. 24, 1981, Ser. No. 286,314

Claims priority, application Austria, Jul. 29, 1975, 5878/75; Oct. 10, 1975, 7770/75

Int. Cl.³ B29C *7/00*

U.S. Cl. 425—548 **11 Claims**

1. In an apparatus for the production of tubular articles of the type wherein two outer annular portions having first inner diameters flank an undercut intermediate annular portion having a larger second inner diameter, particularly in an injection molding machine for thermoplastic synthetic plastic materials, the combination of a mold having an open-and-shut multipartite housing; a core separate from and spacedly surrounded by said housing and defining therewith an annular cavity having a configuration matching the configuration of said articles, said core including an external ring-shaped projection with an outer diameter corresponding to said second inner diameter and two smaller portions flanking said projection and having outer diameters corresponding to said first inner diameters, said core being composed of a tubular first component and a second component, said second component being axially slidably surrounded by said first component; means for opening and closing said housing; means for introducing into said cavity a charge of plasticized synthetic plastic material which fills said cavity and is thus converted into an article of said type while said housing is closed, said housing determining solely



the external configuration and said core determining solely the internal configuration of the article in said cavity; means for maintaining at least one outer portion of the article on said core in a state in which said one outer portion can undergo elastic deformation in open position of said housing; and means for moving said core and the article thereon relative to each other axially of said core and in a direction to force said projection through said one outer portion while said housing is open whereby said one outer portion expands and thereupon contracts so that its inner diameter is again less than said second inner diameter.

4,521,179

INJECTION MOLDING CORE RING GATE SYSTEM

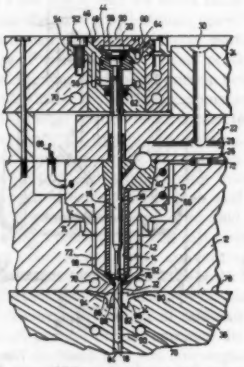
Jobst U. Gellert, 7A Prince St., Georgetown, Ontario, Canada L7G 2X1

Continuation-in-part of Ser. No. 470,192, Feb. 28, 1983, abandoned. This application Jan. 4, 1984, Ser. No. 568,048

Claims priority, application Canada, Feb. 24, 1983, 422305

Int. Cl.³ B29F *1/03, 1/08*

U.S. Cl. 425—548 **12 Claims**



1. In an injection molding system for filling a cavity defined between a cool cavity plate and a cool movable mold platen with an opening therethrough, an elongated valve pin with a tip end which extends through a gate leading to the cavity, through the cavity, and into a bore in the movable mold platen, the gate, the opening through the cavity, and the bore in the

movable mold platen being in alignment and substantially equal in diameter, valve pin actuating mechanism which reciprocates the valve pin between a rearward closed position and a forward open position in which the valve pin extends further through the opening through the cavity, a melt passage which extends through a manifold and around the valve pin to convey pressurized melt from a molding machine to the gate, the valve bin having an elongated head portion adjacent the tip end which extends from a reduced neck portion, the head portion being substantially equal in diameter to the gate, the opening through the cavity, and the bore in the movable mold platen, the reduced neck portion extending past the gate in the open position to provide for the flow of pressurized melt into the cavity,

the improvement wherein the gate extends through a land in the cooled cavity plate and the head portion of the valve pin extends a considerable distance through the cavity into the bore in the movable mold platen, whereby in the retracted closed position contact between the head portion of the valve pin and the surrounding land of the cool cavity plate provides thermal separation between the hot neck portion of the valve pin and the head portion of the valve pin extending through the cavity, and sufficient contact is provided between the movable mold platen and head portion of the valve pin received in said bore to rapidly cool the melt surrounding the valve pin in the cavity.

4,521,180

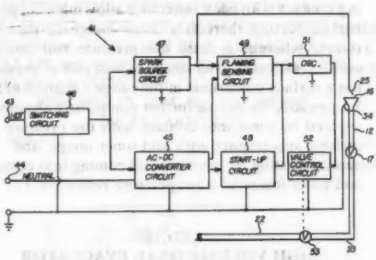
LABORATORY BURNER APPARATUS

Carl W. Walter, Holliston, and William J. Riordan, Shrewsbury, both of Mass., assignors to Kidde, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 445,215, Nov. 29, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 619,771

Int. Cl.³ F23N *5/24*

U.S. Cl. 431—25 **12 Claims**



1. Laboratory burner apparatus comprising:

a burner made from electrically conductive material and adapted for positioning on a counter, said burner comprising an inlet for connection to a gas source and an outlet for feeding gas to a flame;

an electrical power supply comprising an AC supply having hot, neutral, and ground terminals;

an electrically operated valve for controlling the flow of fuel to said burner;

an igniter means energizable by said supply to ignite fuel emanating from said outlet;

igniter activation means for producing either ignition periods during which said igniter means is energized by said supply or non-ignition periods during which said igniter is deenergized, said activation means comprising manual activation means for initiating each of said ignition periods;

said igniter activation means further comprising ground proving means for insuring the integrity of said ground terminal prior to each said ignition period, whereby said igniter means is not energized in the absence of a ground connection;

flame sensing means for detecting the presence of flame at said outlet; and

valve control means for opening said valve only during said ignition periods and periods during which flame is detected by said sensing means.

4,521,181

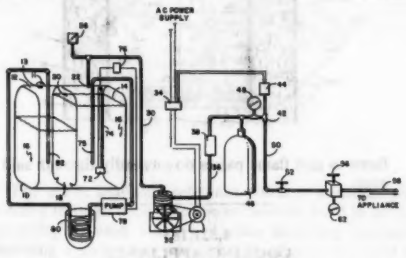
FUEL FUME GENERATOR KIT

Richard A. Delage, 58 Old Pool Rd., Biddeford, Me. 04005

Filed Apr. 26, 1984, Ser. No. 603,924

Int. Cl.³ F23D *11/44*

U.S. Cl. 431—207 **8 Claims**



1. A fuel fume generator kit comprising:

a tank adapted to contain liquid fuel;

a baffle disposed in said tank;

an entry chamber formed in said tank to one side of said baffle;

a vacuum chamber formed in said tank on the other side of said baffle from said entry chamber;

means to enter said fuel into said entry chamber;

means for fuel to pass from said entry chamber to said vacuum chamber while maintaining separate atmospheres in said entry chamber and in said vacuum chamber;

means to heat the fuel in said tank;

means to cause fuel in said vacuum chamber to turn to a fumed state; and

means to cause said fuel fumes to be delivered under pressure to a device to be operated by such fuel.

4,521,182

METHOD AND APPARATUS FOR HEATING PARTICULATE MATERIAL

Albert R. Collins, Ontario, Calif., assignor to Grefco, Inc., Bala Cynwyd, Pa.

Filed Jan. 21, 1982, Ser. No. 341,490

Int. Cl.³ F27B *14/00, 15/00;* C04B *31/22*

U.S. Cl. 432—13 **21 Claims**

1. A method for expanding particulate perlite ore comprising the steps of:

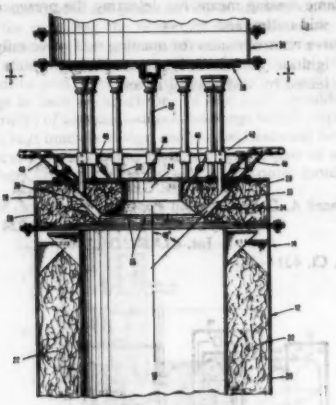
(a) directly a flame downwardly a distance of from two to twelve feet along the central axis of a vertically disposed cylindrical furnace having an unimpeded central portion;

(b) introducing the perlite ore into a plurality of conduits disposed at a plurality of locations distributed radially around said flame at the upper end of said furnace;

(c) injecting compressed air into said conduits in a direction parallel to said conduits; and

(d) placing said perlite ore directly into said flame by injecting said compressed air and perlite ore downwardly and toward the central axis of said furnace directly into the

unimpeded central region of said furnace, whereby said perlite ore and said compressed air are mixed with said



flame as said flame passes downwardly through said furnace.

4,521,183

COOKING APPLIANCE

Masayoshi Hirai, Nara; Junzo Tanaka, Fujiidera, and Katsuroh Ueda, Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

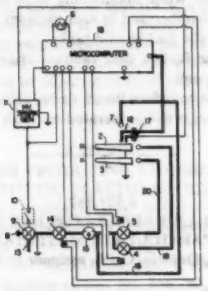
PCT No. PCT/JP82/00439, § 371 Date Jul. 7, 1983, § 102(e) Date Jul. 7, 1983, PCT Pub. No. WO83/01825, PCT Pub. Date May 26, 1983

PCT Filed Nov. 11, 1982, Ser. No. 516,604

Claims priority, application Japan, Nov. 12, 1981, 56-182060

Int. Cl.³ F27B *9/40*; F23M *1/00*

U.S. Cl. 432—37 **2 Claims**



1. A cooking appliance comprising: a heating chamber for receiving a heating load, a heating means for heating said heating chamber, an input means for providing a preset temperature input, a temperature sensor for detecting the temperature in said heating chamber, and a control means including a microcomputer for controlling the heat output and heating time of said heating means in response to signals from said temperature sensor and said input means, wherein temperatures detectible by said temperature sensor are classified by means contained within said microcomputer into at least three levels, namely, an upper limit temperature, a middle temperature, and a lower limit temperature according to said preset heating temperature and wherein said heat output of said heating means is changed in a stepwise fashion according to said temperatures at the respective levels so as to control said heating chamber with respect to said preset heating temperature; and wherein when said temperature being detected by said temperature sensor is respectively said upper limit temperature, said middle temperature and said lower limit temperature, said heating means develops no heat output, half its full heat output and its full heat output, respectively, thereby controlling the atmosphere in said heating chamber so as to be at said preset heating temperature.

4,521,184

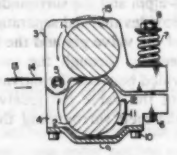
PRESSURE FIXING DEVICE

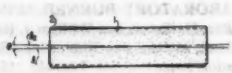
Abe Samuels, Chicago, Ill.; Keitaro Yamashita, Saitama, and Yoshitaka Sasaki, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd., Japan and Speed-O-Print Business Machines Corp., Chicago, Ill.

Filed Oct. 12, 1983, Ser. No. 541,350

Int. Cl.³ G03G *15/00*; F27B *9/28*

U.S. Cl. 432—60 **3 Claims**





1. A pressure fixing device comprising:

a pair of pressure rolls formed of metal maintained in pressing contact with each other and allowing a support member supporting thereon a toner image to pass therebetween, wherein at least the pressure roll coming into contact with said toner image of said pair of pressure rolls has a surface coarseness in the range 1.9 μm(Ra) to about 2.7 μm(Ra), the device further comprising cleaning means adapted to come into contact with the pressure roll not coming into contact with said toner image, and

means for heating the pressure roll coming into contact with said toner image to a temperature below 80° C.

4,521,185

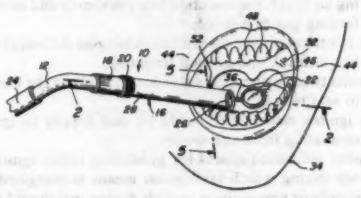
HIGH VOLUME ORAL EVACUATOR

Alan P. Cohen, 50 Mill Rd., Eastchester, N.Y. 10709

Filed Aug. 22, 1983, Ser. No. 525,446

Int. Cl.³ A61C *1/00, 3/00*

U.S. Cl. 433—31 **1 Claim**



1. A high volume oral evacuator which comprises:

(a) a tubular handle adapted to be connected to a source of vacuum;

(b) a tubular tip member;

(c) a rigid sleeve member having a bevelled tapered intake

end with other end secured over said tip member and extending outwardly beyond outer end of said tip member;

(d) means providing a swivel joint of said tip member with said handle whereby said tip member may be freely rotated relative to said handle to variously position the bevelled intake end of said sleeve member within a mouth of a patient;

(e) an operating ring fixed to said tip member containing said swivel joint in position to be manipulated for turning said tip member relative to said handle by fingers of a hand of an operator holding said handle; and

(f) a mirror connected at an angle to the bevelled tapered intake end of said sleeve member, wherein said mirror further comprises a shaft pivotally supported on said sleeve member and adjacent to the bevelled intake end thereof, that further comprises a means for flipping over said mirror and locking said shaft in a stationary position so that in a down position said mirror can be used as a retractor for cheeks and tongue and in a up position as a viewing tool for the upper teeth, wherein said means for flipping over said mirror and locking said shaft in a stationary position comprises;

(i) a reduced threaded shaft member affixed to end of said shaft of said mirror;

(ii) a arm having a transverse threaded aperture in enlarged end thereof that is threadably mounted onto said reduced threaded shaft member so that said arm can flip over said mirror via said shaft of said mirror;

(iii) a nut threadably mounted onto said reduced threaded shaft member to secure said arm thereon; and

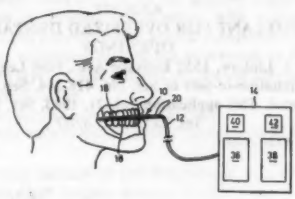
(iv) at least one arm holding ear portion affixed to said rigid sleeve member on either side of said shaft of said mirror so that said arm holding ear portion thus prevents said arm from moving therefrom.

4,521,186

SYSTEM FOR DETERMINING THE FIRST PREMATURITY CONTACT OF DENTAL OCCLUSION

Harold Wodlinger, 614 Yorkhill Blvd., Thornhill, Ontario, Canada L4J 3J7, and Hart V. Katz, 23 Wyvern Rd., Willowdale, Ontario, Canada (M2K 2K3)

Filed May 17, 1983, Ser. No. 495,555
Int. Cl.³ A61C 9/00
U.S. Cl. 433—71 **9 Claims**



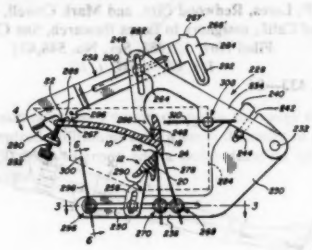
1. A sensor for determining the first dental occlusion prematurity comprising first and second planar portions, said first planar portion having a layer of an insulating material with a plurality of elongate parallel ribs extending longitudinally of said portion, adjacent pairs of ribs defining channels therebetween, conducting elements located in these channels, the second portion having a layer of a planar conducting material, the first and the second portions also having a dilatant layer of boronated methylvinylsiloxane polymer on one side thereof and having substantially the same shape thereas, said polymer being deformable from one position to another position and retaining its deformation thereat whereby in use the first and the second portions are adapted to be inserted in the mouth of a patient such that the first and second portions are located opposite each other; the ribs separating the conducting elements in the first planar portion from the conducting layer of the second planar portion.

4,521,187

DENTAL ANALYZER

James A. Casper, 1830 S. 8th Ave., Yuma, Ariz. 85364

Continuation-in-part of Ser. No. 469,399, Feb. 24, 1983, Pat. No. 4,460,339. This application Jun. 15, 1984, Ser. No. 621,245
Int. Cl.³ A61C 9/00
U.S. Cl. 433—72 **9 Claims**



1. For use in analyzing reference points in a median plane extending through upper and lower dentures fixed in occlusal relationship to each other, a denture analyzing instrument comprising a planar base adapted to be aligned with said median plane, a pivot mounted on said base, a pivot arm pivotally connected to the base by said pivot, said base having an elongated portion, a contact tip fixed to the pivot arm, adjustable means respectively mounted on the pivot arm and the elongated portion of the base for contact with the dentures at the reference points in the median plane, and means for locking the adjustable means in positions contacting at least two of the reference points while the contact tip contacts a third of the reference points on the upper denture in said median plane, said three of the reference points defining a denture spacing triangle.

4,521,188

DOWEL PIN FOR DENTAL MODELS

Steven Metzler, Cherry Hill, N.J., assignor to National Keystone Products Co., Philadelphia, Pa.

Filed Oct. 14, 1983, Ser. No. 542,175
Int. Cl.³ A61C 19/00
U.S. Cl. 433—74 **4 Claims**

1. A dowel pin for use in a dental model, comprising a stem adapted to be embedded in a die, and a body portion coupled to said stem and extending axially therefrom, said body portion being generally frusto-conical in shape and having a first facet thereon facing laterally outwardly with respect to the longitudinal axis of said body portion, a second facet on said body portion facing laterally outwardly with respect to said body portion and disposed obliquely with respect to said first facet so that said facets intersect, and a third facet on said body

portion extending transversely with respect to the axis of said body portion and intersecting said first and second facets, said first facet extending for substantially the length of said body portion, and said second facet extending for more than half of the axial length of said body portion so that said third facet is disposed at a location in the upper half of said body portion and facing toward said distal end.

4,521,189

DENTAL HANDPIECE

Joseph P. Lares, Redwood City, and Mark Cowell, San Carlos, both of Calif., assignors to Lares Research, San Carlos, Calif.

Filed Nov. 3, 1983, Ser. No. 548,431
Int. Cl.³ A61C 1/10
U.S. Cl. 433—84 **8 Claims**

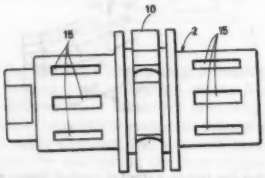
6. A dental handpiece comprising a first casing symmetrical about an axis, a hub extending coaxially from said first casing and having an exterior circular-cylindrical surface concentric with said axis, means forming a plurality of axially spaced fluid outlets in said exterior surface, a second casing symmetrical about said axis, a sleeve extending coaxially within said second casing and having an interior circular-cylindrical surface journalled with uniform rubbing clearance in said exterior circular-cylindrical surface, means in said sleeve forming a plurality of axially spaced fluid inlets in said interior surface and respectively adapted to communicate with said outlets, means for supplying fluid at a relatively high pressure to the endmost ones of said outlets, and means for supplying fluid at a relatively low pressure to intermediate ones of said outlets, whereby the clearance space between the casings and the difference in pressure between the fluid in said endmost outlets and the fluid in said intermediate outlets serve to substantially confine the fluid in said intermediate outlets.

4,521,190

AIR BEARING DEVICE IN DENTAL HANDPIECE

Shozo Nakayama, and Sekiya Ogino, both of Kyoto, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jul. 27, 1983, Ser. No. 517,948
Claims priority, application Japan, Jul. 28, 1982, 57-132895
Int. Cl.³ A61C 1/05
U.S. Cl. 433—132 **3 Claims**



1. An air bearing device in a dental handpiece of the type in which a turbine rotor having a cutting tool shaft set therethrough is journaled by a bearing disposed with a radial gap and a thrust gap between said rotor and said bearing wherein:

said radial gap being defined radially by peripheral walls comprising the inner peripheral wall of said bearing and the outer peripheral wall of said rotor, and being defined longitudinally by said radial gap at one end and by the end of said bearing at the other end;

said radial gap is provided with a plurality of partially enlarged longitudinal gaps in said peripheral walls serving as air pools;

each said partially enlarged gap being isolated from one another and from said ends; and

the longitudinal length of said enlarged gap is larger than the peripheral width thereof.

4,521,191

CONDENSING INSTRUMENT FOR PACKING AND CONDENSING IN CONNECTION WITH PLACEMENT OF DENTAL COMPOSITE RESIN RESTORATIVE MATERIALS

Lars E. M. Ehrnford, Malmö, Sweden, assignor to Austenal International, Inc., Chicago, Ill.

Filed Jan. 3, 1984, Ser. No. 567,557
Int. Cl.³ A61C 3/08
U.S. Cl. 433—164 **20 Claims**

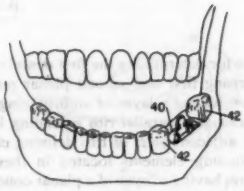
1. A condensing instrument for packing and condensing in connection with placement of dental composite resin restorative materials, characterized in that at least one functional member (4 and/or 5) of the instrument consists of a metal alloy having a coating (6 and 7) of ceramic material which provides the working surface (8 and 9) of the functional member.

4,521,192

ORAL IMPLANT FOR OVERSIZED DENTAL SUPPORT OPENINGS

Leonard I. Linkow, 1530 Palisade Ave., Fort Lee, N.J. 07024

Continuation-in-part of Ser. No. 418,244, Sep. 14, 1982, abandoned. This application Jul. 21, 1983, Ser. No. 516,184
Int. Cl.³ A61C 8/00
U.S. Cl. 433—173 **26 Claims**



1. An oral implant for permanently implanting an artificial tooth supporting structure in at least one opening in an alveolar ridge crest of a patient in which a support for a natural or artificial tooth was previously located, said opening having an upper rim and being oversized with respect to that in which a tooth support is normally positioned, comprising:

an integral support adapted to be fitted horizontally in the oversized opening, said support having a lateral dimension that is adjustable by plastic deformation sufficient to permit the support to be wedged tightly against the alveolar walls of the opening, said lateral dimension being defined by two parallel lateral side portions of the support adapted to contact the alveolar walls in generally parallel planes below the upper rim of the opening; and

at least one post extending from the support in a direction opposite the oversized opening when the implant is installed, said post being adapted for the mounting of an artificial tooth.

4,521,193

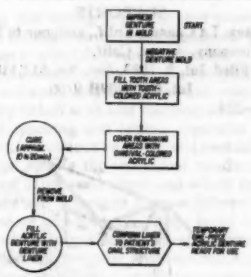
METHOD AND KIT FOR CONSTRUCTING AN AESTHETIC AND FUNCTIONAL TEMPORARY DENTURE

Robert A. Cialone, 475 Shunpike Rd., Chatham, N.J. 07928

Filed Aug. 28, 1981, Ser. No. 297,468

Int. Cl.³ A61K *6/08*

U.S. Cl. 433—199 **10 Claims**


START
NEGATIVE DENTURE MOLD
FILL TOOTH AREAS WITH TOOTH-COLORED ACRYLIC
COVER REMAINING AREAS WITH GINGIVAL-COLORED ACRYLIC
REMOVE FROM MOLD
CURE (APPROX. 10 to 20 min.)
REMOVE DENTURE WITH DENTURE LINER
CONFORM LINER TO PATIENT'S ORAL STRUCTURE
TEMPORARY ACRYLIC DENTURE READY FOR USE

1. A method of making a temporary denture for a denture user, comprising the steps of:

impressing the outer surfaces only of an existing permanent denture of the user into a settable molding composition to form a mold containing an impression of those surfaces;

removing the denture from the mold;

filling the tooth area only up to the gingival margin of the impression in molding composition with a quick cure tooth colored polymerizable acrylic composition;

covering the remaining area of the impression in the mold with a thin layer of pink colored quick-cure polymerizable acrylic composition;

allowing the acrylic composition to cure;

removing the thus-formed acrylic denture shell from the mold;

lining the inner surface of the thus-formed acrylic denture shell with a soft curable denture liner;

conforming the liner to the conformation of the contacting surfaces of the mouth; and

allowing said liner to set in the conformed shape, thereby forming the temporary denture.

4,521,194

METHOD FOR REMOVING INCIPIENT CARIOUS LESIONS AND/OR STAIN FROM TEETH

William D. Myers, 5855 Wingcroft Ct., Birmingham, Mich. 48010, and Terry D. Myers, 25334 Lyncastle La., Farmington Hills, Mich. 48018

Filed Dec. 22, 1983, Ser. No. 564,387

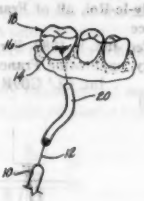
Int. Cl.³ A61C *5/00*

U.S. Cl. 433—215 **3 Claims**

1. A method for removing an incipient carious lesion and/or stain from a tooth comprising the steps of:

aiming a pulsed laser so that the output from the laser impinges upon the incipient carious lesion and/or stain,

repeatedly activating the laser until the incipient carious lesion and/or stain is removed from the tooth,



wherein said laser has a power output in the range of one to one hundred millijoules cm^2, a beam diameter of substantially 50–2000 microns and a pulse duration of several picosecond.

4,521,195

DEVICE FOR SIMULATING THE REPORT EFFECT OF A BLANK CARTRIDGE WHEN FIRING SMALL ARMS

Kurt E. L. Moberg, Box 94060, S-541 04 Skövde, Sweden

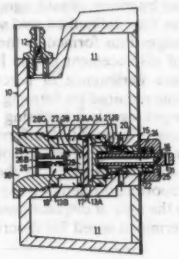
PCT No. PCT/SE83/00174, § 371 Date Dec. 30, 1983, § 102(e) Date Dec. 30, 1983, PCT Pub. No. WO83/03893, PCT Pub. Date Nov. 10, 1983

PCT Filed May 2, 1983, Ser. No. 574,029

Claims priority, application Sweden, May 3, 1982, 8202762

Int. Cl.³ F42D *7/00*

U.S. Cl. 434—16 **5 Claims**



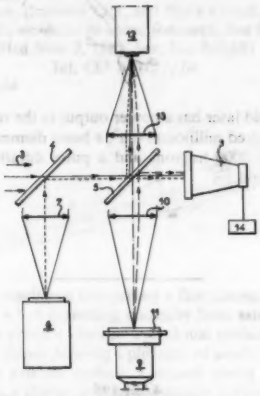
1. A device for simulating the report effect of a blank cartridge when firing small arms, comprising a pressurized gas container (11) and a dosing chamber (13) that are mutually communicable via a communication which can be opened and closed by means of a first valve (16), the dosing chamber having an outlet (18,30) opening out into the surrounding atmosphere and which can be opened and closed with the aid of a second valve (14), the first and second valves being adapted such that when one is closed the other is opened and vice versa, the first valve being adapted to be actuated by the intermediary action of a weapon trigger so that actuation of the trigger results in closing the first valve and opening the second valve for momentary exhaust of a predetermined quantity of gas from the dosing chamber (13B) through the outlet while generating the intended sound shock.

4,521,196

METHOD AND APPARATUS FOR FORMATION OF A FICTITIOUS TARGET IN A TRAINING UNIT FOR AIMING AT TARGETS

René Briard, Orgeval; Christian Saunier, Ermont, and Guy Canova, Marly-le-Roi, all of France, assignors to Giravions Dorand, France

Filed Jun. 9, 1982, Ser. No. 386,778
Claims priority, application France, Jun. 12, 1981, 81 11574
Int. Cl.³ G09B 9/00
U.S. Cl. 434—20 **10 Claims**



1. A training unit for aiming at targets and having an orientable line of sight, comprising means for forming the image of a fictitious target in the field of view of said unit, wherein said image-forming means comprises a screen for visual display of luminous images, means for generating target signals in order to produce target signals defining successive images of a fictitious non-pointlike target as a function of the shape and continuous relative displacement of said target at least in distance from the unit and/or in angular position with respect to the line of sight, means for causing the displacement of a luminous point on the screen by means of said signals in order to display each of the images thus defined on said screen, and means for projecting the images thus formed in the field of view of the unit, the speed of displacement of the luminous point being sufficient to ensure persistence of perception of said point throughout the time required for forming an image, said means for generating target signals comprising a computer for producing said successive images in the form of a series of linear segments and for delivering in respect of each segment three values corresponding respectively to the time derivatives of two rectangular coordinates defining the position of the luminous point and to the time of displacement of the said luminous point at a predetermined speed for describing said segment.

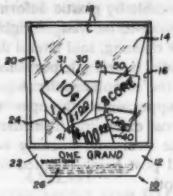
4,521,197

MONEY CALCULATION GAME

Rebecca G. Lumpkins, 817 S. 18th Ave., Maywood, Ill. 60153

Filed Apr. 24, 1984, Ser. No. 603,191
Int. Cl.³ G09B 19/02; A63F 9/04
U.S. Cl. 434—110 **14 Claims**

1. A money recognition and computation game for play by two or more players, comprising three block members, each having a plurality of faces; two of said block members being main members which have monetary amounts on their faces, said amounts corresponding to common currency denominations and the other being a lead member which has symbols indicating scoring or no scoring on at least some of its faces, whereby these members, when caused to be thrown by the players in successive turns or innings and then comes to rest with said member's upward faces determined in a random manner, the players may add or not add the resulting monetary amount shown by the upper faces of the two main members to



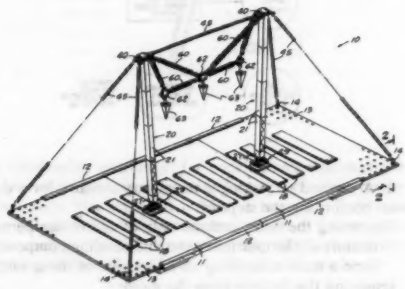
the score of the throwing player, depending upon whether a symbol indicating scoring or no scoring is present on the upper face of said lead member.

4,521,198

INSTRUCTION KIT FOR USE IN MAKING FEASIBILITY STUDIES FOR ERECTING TEMPORARY POWER LINE SUPPORTS

Keith E. Lindsey, La Canada, Calif., assignor to Lindsey Manufacturing Company, Azusa, Calif.

Filed Jul. 8, 1983, Ser. No. 512,118
Int. Cl.³ G09B 9/00
U.S. Cl. 434—224 **20 Claims**



1. An instruction kit of miniature modular restoration components adapted for use in making feasibility studies of different modes of erecting temporary powerline supports while restoring damaged powerline tower supporting means, said kit comprising:

a baseboard;

a multiplicity of tower components having the ends thereof provided with a separable coupling fitting adapted to seat a complementary shaped coupling fitting at the end of another one of said tower components;

said tower components including a plurality of gimbal components having a base at one end thereof and a separable coupling fitting at the other end thereof shaped and sized to seat a selected one of said tower components;

a plurality of guy lines;

a plurality of guy line anchor components a selected one of which is separably mountable on the upper end of each tower assembly formed by an end-to-end assembly of a selected number of said tower components;

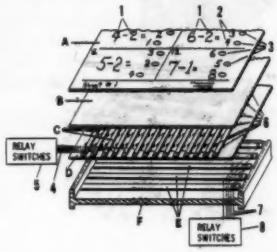
readily separable means for anchoring a tower assembly to a selected area of said base board; and

a plurality of guy lines adapted to be connected between outer areas of said baseboard and the said guy line anchor components assembled to the upper end of said tower assemblies and effective to support at least one of said tower assemblies in a desired generally upright position.

4,521,199
COMPUTER ASSISTED TEACHING MACHINE THAT USES TWO SETS OF CONDUCTIVE STRIPS

J. Richard Harte, 10 West Concord, Kansas City, Mo. 64112

Filed Nov. 23, 1983, Ser. No. 554,692
Int. Cl.³ G09B 7/06
U.S. Cl. 434—339 11 Claims



1. A teaching and testing apparatus that provides students with immediate feedback as to the correctness or incorrectness of their responses to true-false, multiple choice, or cross matching questions and answers by the use of: a computer and related hardware and software, said computer and related hardware being electrically linked with said teaching and testing apparatus; where said teaching and testing apparatus incorporates two different sets of conductive strips; said two different sets of conductive strips having the individual conductive strips in each set arranged in the same plane; and where the two sets of conductive strips are organized in two different but parallel planes, with one set of conductive strips being located above the other; and where instructional or testing sheets containing a variety of indicia and response areas are positioned in a third plane that is above and parallel to the two preceeding planes; and where downward pressure at any response area on or in a testing or an instructional sheet causes a deflection of one of the conductive strips in one of the sets of conductive strips, said deflection resulting in a switching action that relays information to the computer, which in conjunction with other information tells the computer which response area on or in a testing or instructional sheet was responded to by the student, said computer having been previously programmed to operate in a teaching mode and to know which response areas are correct responses and which are incorrect response areas; and after evaluating this particular response, the computer sends information back to the student as to the correctness or incorrectness of this particular response on this particular instructional sheet.

4,521,200
SURFBOARD TYPE BOAT CONVERTIBLE INTO SAILBOAT OR BUOY

Ubaldo Fatello, via Filangieri n. 14, 10128 Turin, Italy

Filed Sep. 30, 1983, Ser. No. 538,028
Claims priority, application Italy, Oct. 14, 1982, 53811/82[U]; Nov. 17, 1982, 53932/82[U]
Int. Cl.³ B63H 16/08
U.S. Cl. 440—23 5 Claims

1. A surfboard type boat convertible into a sailboat or buoy, comprising:

a floating board in the form of an annular disk formed of a shell of plastic material;

an annular body of foamed plastic material contained therein, said shell preventing the penetration of water into said disk;

a cone-shaped keel having an annular base flange extending to the edge of said shell and secured thereto;

a foam plastic material filling said keel and defining an ejector tube seat;

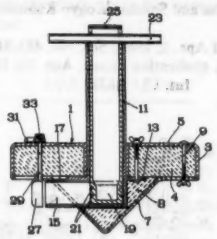
a propelling assembly including a cylinder extending through and upwardly from and perpendicularly of said floating board;

a flange on said cylinder for securing said cylinder to said floating board and a lateral tubular nozzle at one end of said cylinder forming an ejection tube;

said nozzle extending perpendicular to the axis of said cylinder and support within said keel seat;

said cylinder being a tube of hard and polished plastic material;

a propelling piston slidably mounted and sealed within said cylinder and made of a tube of plastic material;



said piston being closed at the bottom;

a handle bar extending perpendicularly through said piston at its upper end and projecting laterally therefrom on both sides permit it to be gripped by the user;

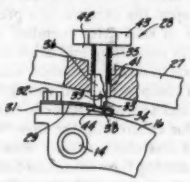
a rudder underlying and secured to said floating board downstream of said nozzle;

and a transverse control bar located on the upper surface of said floating board connected to said rudder, said control bar being operable by the users heels.

4,521,201
STEERING DEVICE FOR AN OUTBOARD MOTOR

Eifu Watanabe, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Feb. 17, 1983, Ser. No. 467,304
Claims priority, application Japan, Feb. 22, 1982, 57-26140
Int. Cl.³ B63H 25/02
U.S. Cl. 440—55 7 Claims



1. In a steering device for an outboard motor or the like comprising a first member adapted to be affixed to a vessel, a second member journalled for steering movement relative to said first member, the improvement comprising releasable means for releasably restraining said second member against steering movement relative to said first member comprising a pair of positively interengaging elements cooperating to prevent steering movement of said second member relative to said first member upon normal forces being exerted to said second member and to release the interengagement between said elements upon the exertion of greater than normal forces to said second member, said interengaging elements being positioned to interengage when said second member is only in a specific orientation relative to said first member and wherein said

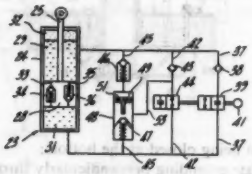
interengaging elements offer no resistance to steering movement when the second member is in other than that one position, and means for manually releasing the interengagement between the elements, comprising means for permitting one of the elements to be moved relative to its interengaged position with the other of the elements to a released position wherein said elements do not interengage and means for retaining said one element in its released position.

4,521,202

TILT LOCKING SYSTEM FOR SHIP PROPELLERS

Ryoji Nakahama, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Apr. 1, 1983, Ser. No. 481,315
Claims priority, application Japan, Apr. 26, 1982, 57-68750
Int. Cl.³ B63H *5/12*
U.S. Cl. 440—61 **14 Claims**



1. In a tilt locking and shock absorbing arrangement for a marine outboard trim comprising a drive member supported for tilting movement relative to a hull of an associated watercraft about a substantially horizontally disposed tilt axis, a hydraulic assembly comprising a cylinder and a piston slidably supported in said cylinder and dividing said cylinder into first and second chambers, means for operatively interposing said hydraulic assembly between said hull and said drive member for relative movment of said piston and said cylinder upon tilting movement of said drive member about said tilt axis, first passage means including pressure responsive absorber valve means for permitting flow from said first chamber to said second chamber upon the application of a predetermined force tending to cause said drive member to tilt up about said tilt axis, and second passage means including pressure responsive relief valve means for permitting flow from said second chamber to said first chamber upon the exertion of a predetermined force to effect tilt down of said drive member, the improvement comprising means for permitting said drive member to be tilted up about said tilt axis to a raised position and to be retained in said raised position comprising third passage means extending between said first and second chambers, first manually operated valve means for controlling the flow through said third passage means, and first check valve means in said third passage means for permitting flow from said first chamber to said second chamber when said first manually operated valve means is opened and for precluding flow from said second chamber to said first chamber through said third passage means when said first manually operated valve means is opened.

4,521,203

TOY CONSTRUCTION KIT

Lee M. Rothenberg, Jr., Homewood, Ill., assignor to International Honeycomb Corporation, Park Forest South, Ill.

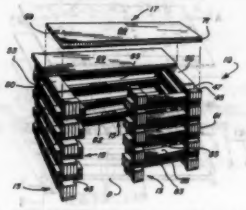
Continuation of Ser. No. 455,856, Jan. 5, 1983, abandoned. This application Apr. 23, 1984, Ser. No. 602,630
Int. Cl.³ E04B *1/10*; A63H *33/00*
U.S. Cl. 446—106 **7 Claims**

1. A toy construction kit for erecting life-size playhouses comprising:

a plurality of kraft paper building blocks having a pair of opposite surfaces and being substantially square in section, said building blocks comprising a composite, three-tier honeycomb structure between said opposite surfaces, and

a recess formed in each of said opposite surfaces, said recess being substantially shallower than the distance between said opposite surfaces,

each said building block honeycomb structure comprising a main body section and flat riser sections secured to said main body sections to form said opposite surfaces, said main body section and said riser sections each comprising



a separate honeycomb core, and said riser sections defining the sides of said recesses, each said honeycomb core comprising a plurality of individual cells having a longitudinal axis extending transversely of said opposite surfaces,

whereby a building block can accommodate and interlock with another building block in said recesses so that said opposite surfaces are always in vertically spaced relationship with the next adjacent block,

the vertical spacing between blocks permitting the entry of ambient air and light into a playhouse built of said bblocks.

4,521,204

REMOTELY-CONTROLLED TOY VEHICLE

Christopher C. Wiggs, 64 Goldborough Crescent, Chingford, London E4, and Christopher J. C. Taylor, 1017 Latchmere Rd., London, SW. 11, both of England

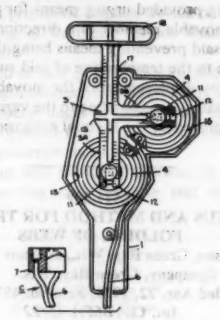
Filed Apr. 26, 1984, Ser. No. 604,107
Claims priority, application United Kingdom, Apr. 29, 1983, 8311768
Int. Cl.³ A63H *13/00*
U.S. Cl. 446—198 **6 Claims**

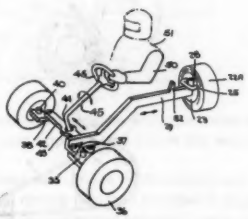
1. A remote control system for a toy vehicle having a steering mechanism and a d-c motor for driving the vehicle, the motor being connected to a battery through a three-position switch having a neutral position, a forward travel position in which the battery voltage is applied to the motor in one polarity, and a reverse travel position in which the battery voltage is applied to the motor in the opposite polarity, said system comprising:

A. a handset provided with first and second master diaphragm chambers and a handle-operated torsion bar so coupled to the master chamber that when the torsion bar is shifted by its handle from side to side, the first master chamber is either compressed or expanded; and when the torsion bar is twisted by its handle clockwise or counterclockwise, the second chamber is either compressed or expanded, said torsion bar being provided at its end with a slot that is slidably engaged by a stud projecting from the diaphragm of the first master chamber, said bar having a side arm provided at its end with a slot that is slidably engaged by a stud projecting from the diaphragm of the second master chamber;

B. first and second slave diaphragm chambers disposed in said vehicle, the first slave chamber being operatively coupled to said steering mechanism to cause steering in a direction that depends on whether this chamber is compressed or expanded, said second slave chamber being operatively coupled to said switch to cause said switch to assume said forward or reverse position depending on whether this chamber is compressed or expanded; and

C. a pneumatic tether line coupling said first and second handset master chambers to the first and second slave





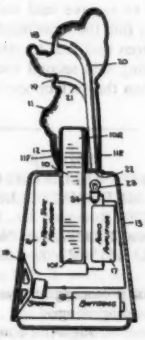
chambers, said line being formed by a pair of flexible pipes.

4,521,205

SOUND TAPE PLAYER HAVING AN ANIMATED CHARACTER

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed May 30, 1984, Ser. No. 615,380
Int. Cl.[3] A63H *3/28*
U.S. Cl. 446—302 **9 Claims**



1. A tape player in combination with sound magnetic tape packages, the combination comprising:

A a three-dimensional character joined to each of said packages and functioning as a handle therefor, said character having eye openings covered by translucent elements;

B light guides extending from an optical inlet on said character to said elements to conduct light thereto;

C a tape player whose case has a light outlet therein and is provided with a slot to receive a tape package whereby when the package is inserted therein the character is exposed to view and said optical inlet is then in registration with said light outlet, said player housing within said case a playback mechanism which is operatively coupled to the inserted package to drive the tape and to produce an audio signal in accordance with the recording on the tape, which signal is fed to an amplifier whose output is applied to a sound producer; and

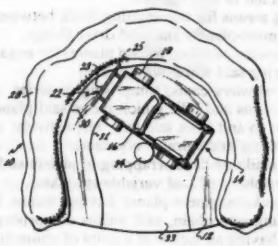
D a light emitter coupled to the output of the amplifier and placed behind the light outlet, the light generated by said emitter being modulated by said signal to produce light pulses which are conveyed to the eye elements to impart animation to the character in synchronism with the reproduced sound.

4,521,206

TRACK FOR TOY VEHICLES

Gary M. Saffer; Gérard L. Lambert, both of Torrance, and Howard R. Stern, El Segundo, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 27, 1983, Ser. No. 565,307
Int. Cl.[3] A63H *18/02*
U.S. Cl. 446—444 **4 Claims**



1. A curved track for use with a self-propelled toy vehicle having wheels and a body, comprising in combination:

a surface portion over which the toy vehicle travels, said surface portion being formed so that said toy vehicle traveling around said track is tilted;

a wall portion upstanding from said surface portion and having a curved inner surface in the form of a semi-circle which defines the curved portion of the track;

a post portion upstanding from said surface portion and positioned at the geometric center of the semi-circle whereby as said vehicle enters the curved portion of the track, the forward part of a first side of said vehicle body contacts said curved inner surface, and a rear part on a second side of said vehicle body, opposite the first side, contacts said post portion, causing said vehicle to pivot about said post portion in a direction which assists said vehicle in negotiating said curved portion of said track;

a lip integral with and projecting inwardly from said wall portion at a predetermined distance above said surface portion to form a recess around the inner periphery of said track; and

a bumper, including a brush bar and a guide rod connected to and extending across the front of said toy vehicle, said brush bar contacting and sliding along said lip and said guide rod being positioned beneath said lip as said vehicle travels around said track to prevent the wheels of said vehicle from climbing up from said track.

4,521,207

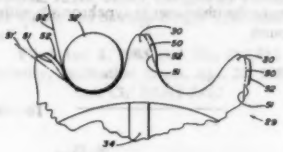
INCREMENTALLY VARIABLE TRANSMISSION

Royce H. Husted, 711 Lakeside, Wheaton, Ill. 60187, assignor to Royce H. Husted, Wheaton and Samuel Shiber, Mundelein, both of, Ill.

Continuation-in-part of Ser. No. 387,618, Jun. 11, 1982, Pat. No. 4,493,678, which is a continuation-in-part of Ser. No. 310,506, Oct. 13, 1981, abandoned. This application Jan. 10, 1983, Ser. No. 456,736

Int. Cl.³ F16H *9/10, 9/24, 9/02, 55/30*

U.S. Cl. 474—56 **6 Claims**



1. A variable sprocket comprising in combination:
an axle,
a drive flange mounted on said axle,
an indexing flange rotatably mounted on said axle opposite of said drive flange and having a plurality of spiral-wavy-cams,
two sprocket-segment-planets and at least two idler-planets connected to said flanges,
coupling means for transmitting force between said sprocket-segment-planets and said drive flange,
cam followers attached to said planets for engaging with and following said spiral-wavy-cams,
said spiral-wavy-cams comprising a series of alternating depressions and hills which move said planets closer and further to and from said axle, respectively, as said planets slide along said spiral-wavy-cams,
a chain made of links wrapping approximately one half of the periphery of said variable-sprocket,
said sprocket-segment-planet having means for positively engaging said chain, said means comprising at least one tooth having an incline at a point of contacting said chain, said incline being steep so as to prevent said chain from disengaging from said tooth while said tooth carries chain's load.

4,521,208

TENSION-ADJUSTING DEVICE FOR TOOTHED DRIVING BELTS SUBJECTED TO WIDE TEMPERATURE DIFFERENTIALS

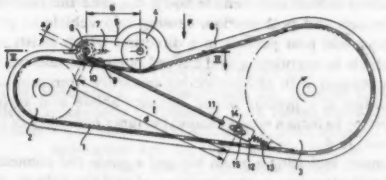
Carlo Doveri, Pontedera, Italy, assignor to Piaggio & C. S.p.A., Genova, Italy

Filed Jul. 20, 1982, Ser. No. 400,087

Claims priority, application Italy, Jul. 23, 1981, 23094 A/81

Int. Cl.³ F16H *7/08*

U.S. Cl. 474—101 **6 Claims**



1. A device for adjusting the pull of a driving belt, more particularly a toothed belt controlling a timing shaft in an internal combustion engine, running on at least two sheaves borne by a supporting member exposed to thermal expansion, comprising a tensioning idler mounted on a movable member on the supporting member for acting in one direction upon the belt, there being provided urging means for preventing movement of said movable member in a direction opposite to said one direction, said preventing means being thermally expansible in response to the temperature of said supporting member in order to allow displacement of the movable member by an extent substantially corresponding to the variation of the sag of the belt as originated by the thermal expansion of the supporting member.

4,521,209

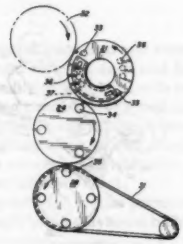
APPARATUS AND METHOD FOR TRANSVERSE FOLDING OF WEBS

Allen J. DuFresne, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Apr. 22, 1983, Ser. No. 487,569

Int. Cl.³ B65H *45/22*

U.S. Cl. 493—432 **12 Claims**



1. A folder for transversely folding web material comprising a frame,
a first vacuum roll rotatably mounted on said frame and equipped with at least two vacuum ports spaced equally circumferentially about the surface of said first vacuum roll for maintaining segments of said web material against the roll surface and means operatively associated with said first vacuum roll for selectively applying and withdrawing vacuum from said ports, and
a second vacuum roll rotatably mounted on said frame adjacent said first vacuum roll and equipped with vacuum port means adapted to receive said web segments therefrom and transversely fold the same incident to transfer of each web segment from said first to said second vacuum roll, means for rotating said second vacuum roll at a surface speed slower than the surface speed of said first vacuum roll.

4,521,210

EYE IMPLANT FOR RELIEVING GLAUCOMA, AND DEVICE AND METHOD FOR USE THEREWITH

Vernon G. Wong, 10908 Rosemont Dr., Rockville, Md. 20852

Filed Dec. 27, 1982, Ser. No. 453,357

Int. Cl.³ A61M *27/00*; A61B *17/00*

U.S. Cl. 604—8 **28 Claims**

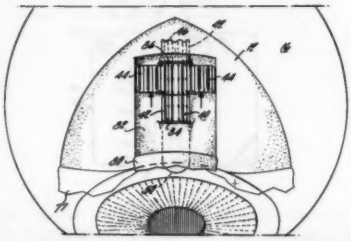
25. The method of providing an eye implant for relieving excess eye pressure, comprising:
cutting a flap in and through the conjunctiva to expose the underlying sclera from a position adjacent to the limbus to a position above the underlying choroid;
cutting part-way through said exposed sclera to form a scleral flap and to define an underlying scleral bed extending from a position adjacent the limbus to a position adjacent the choroid;
making an anterior incision through said scleral bed adjacent to the limbus to form a sclerotomy;
making a posterior incision through said scleral bed on the

side of said anterior incision toward the choroid to form another sclerotomy;

providing a thin prosthetic implant device of biocompatible material having at least one surface channel extending along its length;

inserting one end of said device through said first incision, and along a path between the ciliary body and the sclera, into the peripheral angle of the anterior chamber of the eye, until the opposite end of said device lies between said anterior and posterior incisions;

thereafter sliding said device lengthwise in the posterior direction, inserting said opposite end of said device



through said posterior incision, and continuing said sliding motion until said opposite end enters the suprachoroidal space;

thereafter, suturing said device to the scleral bed while said one end of said device is in said peripheral angle and said opposite end is in said suprachoroidal space, and successively closing said scleral flap and said conjunctival flap.

28. A surgical implant device for use in the eye to relieve excess eye pressure, comprising:

a thin body of biocompatible material having at least one externally-open surface channel of a length to extend from the limbal angle of the anterior chamber of the eye toward the choroid of the eye, at least as far as the ciliary body.

4,521,211

PARENTERAL AGENT DISPENSING EQUIPMENT

Felix Theeuwes, Los Altos, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 377,831, May 13, 1982, Pat. No. 4,439,183, which is a continuation-in-part of Ser. No. 310,047, Oct. 9, 1981,. This application Feb. 3, 1984, Ser. No. 576,572

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.³ A61M *5/14*

U.S. Cl. 604—85 **13 Claims**

1. A formulation chamber for use in a parenteral delivery system, comprising:

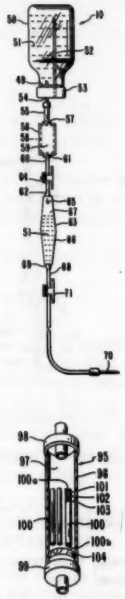
(a) a wall surrounding an internal space;

(b) an inlet for admitting a fluid into the chamber;

(c) an outlet for letting a fluid leave the chamber; and,

(d) a multiplicity of hollow fibers in the chamber, the hollow fibers comprising:

(1) a wall surrounding a lumen in the fiber, said fiber having a pair of openings disposed from each other; and,



(2) a beneficial parenterally administrable agent in the lumen that is delivered into fluid that enters the formulation chamber and contacts the fiber.

4,521,212

SOLUTION ADMINISTRATION SET

Rick R. Ruschke, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 3, 1982, Ser. No. 404,810

Int. Cl.³ A61M *5/14*

U.S. Cl. 604—126 **13 Claims**

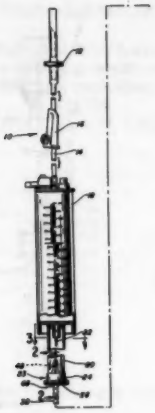
1. A parenteral solution administration set having tubular means for conveying solution from a supply source toward the vascular system of a patient, comprising:

a metering chamber measuring aliquots of solution for administration;

a drip chamber connected to said metering chamber and having upper and lower ends positioned below said metering chamber;

said drip chamber including, at its lower end, a porous, hydrophilic filter member having a pore size sufficiently small to prevent air at a predetermined maximum pressure from passing through said filter member when wet, while permitting the flow of parenteral solution therethrough, said filter member being operative at the lower end of the drip chamber to control flow out of said lower end and to

be submerged by liquid held in the drip chamber during operation thereof;



said metering chamber and drip chamber being free of any air-blocking membrane therebetween, whereby back priming of the set is enabled.

4,521,213

LIQUID DRAINAGE SYSTEM WITH HINGED CUP-SHAPED VALVE

Carl J. Steigerwald, Wauconda, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 10, 1983, Ser. No. 465,375

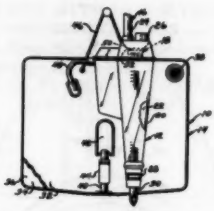
Int. Cl.³ A61M *1/00*

U.S. Cl. 604—323 **7 Claims**

1. A liquid drainage system, comprising:

a receptacle having a chamber to receive liquid, and a depending annular wall in an upper portion of the receptacle; and

A valve comprising a cup-shaped member of elastic material having a lower wall extending across the cup-shaped member, an upper annular wall extending from said lower wall, with an upper portion of said valve annular wall being snugly received on a lower portion of the receptacle wall, and a hinge member extending outwardly from the cup-shaped member at one side of the lower wall, said cup-shaped member having a slit extending through the cup-shaped member to the hinge member at a location



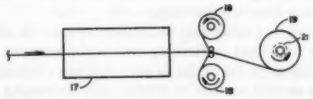
slightly above the lower wall, said slit defining a valve seat above the lower wall with the lower wall serving as a valve element which may sealingly engage against the seat, with said hinge member connecting the lower wall and valve annular wall, wherein said hinge member has a vertical opening spaced from an outer portion of the hinge member and extending therethrough, with said slit extending to the opening to define a pair of hinges on opposed sides of the opening.

4,521,214

CONTINUOUS GRADIENT DYEING OF PLASTIC RIBBON

Robert Weis, Leominster, Mass., assignor to American Hoechst Corporation, Somerville, N.J.

Division of Ser. No. 429,653, Sep. 30, 1983, Pat. No. 4,442,788.
This application Jan. 9, 1984, Ser. No. 569,427
Int. Cl.[3] B05C *3/02*
U.S. Cl. 8—506 8 Claims



1. A process for producing in a continuous manner a gradient dyed plastic ribbon, wherein said ribbon is passed longitudinally through a dye bath by a ribbon drive means, the plane of said ribbon is maintained at a substantially constant angle with respect to the dye bath surface during the residence of said ribbon in the dye bath, the liquid level of the dye bath is repetitively varied with time between two pre-determined levels by a liquid level control means and the overall orientation of that portion of the ribbon which is undergoing the dyeing process in the dye bath is substantially level from one end to the other.

4,521,215

POLYVINYL CHLORIDE RESIN PARTICLES DYED WITH CATIONIC DYESTUFFS AND PROCESS OF PREPARATION

William J. Kauffman, Penn Township, Lancaster, and Pamela H. Martin, Warwick Township, Lancaster County, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Apr. 27, 1983, Ser. No. 489,041
Int. Cl.[3] D06P *1/41, 3/79*
U.S. Cl. 8—508 14 Claims

1. Polyvinyl chloride particles comprising a cationic dyestuff, said particles being obtained from the contacting of a particulate polyvinyl chloride material with a composition consisting essentially of a liquid medium and a cationic dyestuff, said dyestuff being substantially soluble in said liquid medium and said particles being substantially insoluble in said liquid medium.

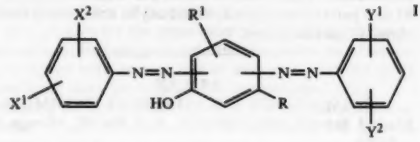
4,521,216

DISAZO DYES

Herbert Armbrust, Gruenstadt; Johannes P. Dix, Neuhofen; Guenter Hansen, Ludwigshafen, and Georg Zeidler, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,100
Int. Cl.[3] C09B *31/062, 33/044, 33/06, 33/08*
U.S. Cl. 8—639 7 Claims

1. A disazo dye of the formula:



wherein

R is hydroxyl, amino or amino which is substituted by branched or unbranched C_1–C_{15} alkyl;

R^1 is hydrogen or C_1–C_{12}-alkyl;

X^1 and Y^1 independently of one another are each C_1–C_{15}-alkoxy, C_1–C_{15}- alkoxy interrupted by oxygen, or carboxylic acid ester, the alcoholic portion of which is C_1–C_{15}-alkyl; and

X^2 and Y^2 independently of one another are each hydrogen, nitro and chlorine.

4,521,217

PHTHALOCYANINE AND AZO DYESTUFF MIXTURES AND THEIR USE FOR DYEING PAPER

Ulrich Beck, Bornheim; Frank-Michael Stöhr, Burscheid, and Horst Nickel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 6, 1984, Ser. No. 568,854
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1983, 3300896
Int. Cl.[3] C09B *47/04, 67/22;* D21H *1/46*
U.S. Cl. 8—639 6 Claims

1. A mixture of

(A) a phthalocyanine dyestuff having 1.5–4 cationic and/or basic groups and 0 or 1 sulfonic acid group, and

(B) one eighth to twice its molar amount of a substantive azo dyestuff with a total number of cationic and/or basic groups greater than 2.

4,521,218

PROCESS FOR PRODUCING A COAL-WATER MIXTURE

Edward H. Greenwald, Sr., 92 Nancy La., McMurray, Pa. 15137

Filed Feb. 21, 1984, Ser. No. 581,538
Int. Cl.[3] C10L *1/32*
U.S. Cl. 44—51 12 Claims

1. In a process for producing a coal-water mixture, the steps comprising:

forming at least first and second coal feed streams comprised of differently-classified coal particle sizes and an aqueous liquid medium,

determining the concentration of the coal particles in the aqueous liquid medium forming each of said coal feed streams, and

mixing together a portion of each coal feed stream in the presence of a dispersing and stabilizing agent to form a coal-water mixture comprised of at least 65% by weight coal particles.

4,521,219

ALCOHOL BASED FUELS CONTAINING CORROSION INHIBITORS

Warren L. Perilstein, Orchard Lake, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 2, 1981, Ser. No. 317,569
Int. Cl.[3] C10L *1/08*
U.S. Cl. 44—55 32 Claims

1. A liquid fuel for use in internal combustion engines comprising a major amount of a monohydroxy alkanol having from 1 to about 5 carbon atoms, and a corrosion inhibiting amount of a mixture of (a) from about 5 to 95 parts of at least one polymerized unsaturated aliphatic monocarboxylic acid having

from about 16 to 18 carbon atoms per molecule, and (b) from 95 to 5 parts of an aliphatic dicarboxylic acid having from 2 to about 10 carbon atoms.

4,521,220

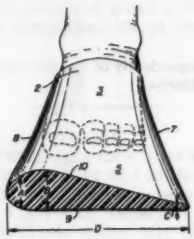
SWIM FIN FOR BREASTSTROKE SWIMMERS

Mark J. Schoofs, 1635 School St., P.O. Box 67, Moraga, Calif. 94556

Continuation of Ser. No. 474,505, Mar. 11, 1983, abandoned. This application Oct. 3, 1984, Ser. No. 657,576

Int. Cl.³ A63B *31/11*

U.S. Cl. 441—64 **2 Claims**



1. A swim fin for use in breaststroke swimming comprising a shoe-like rear compartment for receiving a human foot and a closed widened forward extension from said compartment, said forward extension having a relatively flat bottom surface and a continuously convex upper surface so cambered that the thickness of the extension adjacent its inner side is greater than its thickness at the outer side and generally conforms in cross-sectional shape to the cross section of an airplane wing, said fin having sufficient firmness to hold its shape during passage through water when in use.

4,521,221

METHOD OF PRODUCING A METHANE-RICH GAS MIXTURE FROM MINE GAS

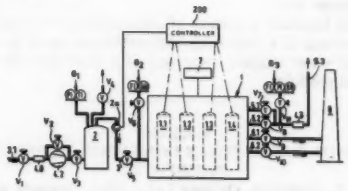
Ekkehard Richter, Essen; Werner Körbächer, Mülheim; Karl Knoblauch, Essen, and Klaus Giessler, Gelsenkirchen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,433

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306371

Int. Cl.³ C10K *3/00*

U.S. Cl. 48—196 R **6 Claims**



1. A method of producing a product gas having a final methane content of about 50 volume percent which remains substantially constant from a crude gas having a variable but lower methane content by pressure-swing adsorption in at least one adsorber, said method comprising the steps of:

(a) adsorbing methane from said crude gas at an adsorption pressure between substantially 5 and 8 bar on a carbon molecular sieve adsorbent traversed by said crude gas in one direction to produce a waste gas containing only trace amounts of methane;

(b) thereafter expanding said adsorbent to an expansion pressure substantially between 2.5 and 5 bar and substantially midway between the adsorption pressure and a subsequent flushing pressure while discharging a waste gas containing only trace amounts of methane in uniflow to the adsorption;

(c) thereafter expanding the adsorbent to the flushing pressure between substantially 1.1 and 2 bar in counterflow to the adsorption and recovering a first portion of product gas containing about 50 volume percent methane therefrom in a first product stage; and

(d) flushing said adsorbent in counterflow to the adsorption with a waste gas containing only trace amounts of methane from steps (a) or (b) at said flushing pressure to produce a second portion of product gas containing about 50 volume percent methane therefrom, combining said portions of said product gas forming said product gas having said final substantially constant methane content of about 50 volume percent.

4,521,222

RESIN-BONDED GRINDING ELEMENTS WITH DUAL COATED DIAMOND GRIT FOR DRY GRINDING AND WET GRINDING CEMENTED CARBIDE WORKPIECES

Philippe D. St. Pierre, Worthington, and Michael T. Buckner, Columbus, both of Ohio, assignors to General Electric Company, Worthington, Ohio

Filed Sep. 30, 1982, Ser. No. 429,938

Int. Cl.³ B24D *11/00*

U.S. Cl. 51—295 **17 Claims**

1. In a method for grinding a workpiece selected from the group consisting of cemented tungsten carbide and combinations of cemented tungsten carbide and steel with a resin bonded grinding element having metal-coated diamond particles embedded in the grinding surface thereof, the improvement for providing coated diamond particles useful for both dry grinding and wet grinding operations which comprises using diamond particles coated with two layers of metal, the inner layer comprising nickel which comprises between about 40% and 130% by weight of said diamond particles, the outer layer comprising silver which comprises between about 20% and 70% by weight of said diamond particles, the total weight of said coatings not exceeding above about 200% by weight of said diamond particles.

4,521,223

METHOD FOR DETERMINING THE EXISTENCE OF AN OPTIMAL INTERVAL FOR RAPPING THE ELECTRODES OF AN ELECTROSTATIC PRECIPITATOR

Horst Daar, Erlangen, and Franz Alig, Johannesberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, both of, Fed. Rep. of Germany

Filed Jul. 9, 1984, Ser. No. 628,776

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326040

Int. Cl.³ B03C *3/76*

U.S. Cl. 55—13 **5 Claims**

1. A method for operationally determining the existence of an optimal knocking period for the rapping of the collector electrodes for an electrostatic precipitator, comprising the steps of:

(a) operating the precipitator under dust-free gas flow conditions;

(b) during the execution of step (a), measuring the current flow to and the voltage across at least one pair of the electrodes;

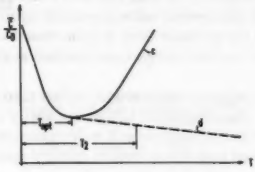
(c) determining, from the measurements of current flow and

voltage in step (b), a current-voltage characteristic for dust-free operation of said precipitator;

(d) operating said precipitator under actual use conditions;

(e) during the execution of step (d), measuring the current flow to and the voltage across at least said one pair of said electrodes;

(f) determining, from the measurements of current and voltage in step (e), a current-voltage characteristic for actual use operation of said precipitator; and



(g) comparing the current-voltage characteristic arrived at in step (f) with the current-voltage characteristic arrived at in step (c) to determine whether the electrical resistance of a dust layer accumulated on said electrodes during actual use operation is at least equal to the electrical resistance of pure gas passing between said electrodes during dust-free operation of said precipitator, thereby determining whether an optimal knocking period exists.

4,521,224

SEMIPERMEABLE MEMBRANES PREPARED FROM POLYMERS CONTAINING PENDENT SULFONE GROUPS

George S. Li, Macedonia, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

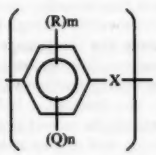
Continuation-in-part of Ser. No. 357,366, Mar. 12, 1982, Pat. No. 4,427,419. This application Jan. 16, 1984, Ser. No. 570,976

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.³ B01D *53/22*

U.S. Cl. 55—16 **20 Claims**

1. A semipermeable membrane useful for the separation of gases from a mixture containing at least two fractions into enriched fractions of each, the membrane formed from at least one polymer containing a preponderance of arylene units of the formula



(I)

where

each R is independently a C_1–C_8 aliphatic or a C_5–C_7 cycloaliphatic hydrocarbon radical, an aryl radical, an aralkyl radical or an alkaryl radical, each radical being free of a tertiary alpha-carbon atom;

each Q is a radical of the formula

(II)

where R′ is a C_1–C_{20} linear or branched hydrocarbon;

X is a divalent oxygen or sulfur atom or a carbonate group;

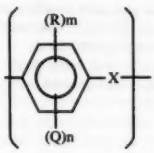
m is an integer of 0–2; and

n is 0–1 with the proviso that n is 1 in at least 10 percent of the arylene units of the polymer.

11. In a process for the separation of gases from a mixture containing at least two gases into two fractions, one fraction being enriched with at least one of said gases and the other fraction being depleted in same, the process comprising:

contacting the gaseous mixture with a semipermeable membrane in such a manner that a portion of the gaseous mixture selectively passes through the membrane resulting in the enriched fraction being on one side of the membrane and the depleted fraction being on the other side of the membrane, the improvement comprising

the use of a semipermeable membrane formed from at least one polymer containing a preponderance of arylene units of the formula



(I)

where

each R is independently a C_1–C_8 aliphatic or a C_5–C_7 cycloaliphatic hydrocarbon radical, an aryl radical, an aralkyl radical or an alkaryl radical, each radical being free of a tertiary alpha-carbon atom;

each Q is a radical of the formula

(II)

where R′ is a C_1–C_{20} linear or branched hydrocarbon;

X is a divalent oxygen or sulfur atom or a carbonate group;

m is an integer of 0–2; and

n is 0–1 with the proviso that n is 1 in at least 10 percent of the arylene units of the polymer.

4,521,225

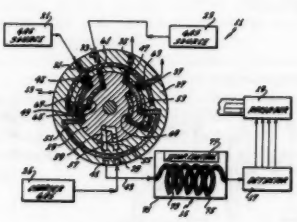
INSTRUMENT AND PROCESS FOR TESTING LANDFILL GAS FOR CHLORINATED HYDROCARBONS

Richard L. Jenkins, Whittier; John A. Pettus, Westminster, and David K. Abner, Sherman Oaks, all of Calif., assignors to Getty Synthetic Fuels, Inc., Signal Hill, Calif.

Filed Oct. 11, 1983, Ser. No. 540,929

Int. Cl.³ B01D *15/08*

U.S. Cl. 55—18 **20 Claims**



1. A method for determining the concentration of chlorinated hydrocarbons in landfill gas comprising:

injecting a carrier gas and landfill gas containing a plurality of chlorinated hydrocarbons into a gas chromatographic separation module which includes a column containing a

column packing capable of separating the chlorinated hydrocarbons;

controlling the temperature of the separation module to separate the chlorinated hydrocarbons from the separation module;

said step of controlling including providing an initial temperature of 0 to 45 degrees celsius for no more than 60 minutes, increasing the initial temperature at a rate of 1 to 5 degrees celsius per minute to a final temperature of from 45 to 130 degrees celsius and holding the final temperature for no more than 60 minutes; and

detecting the concentration of the chlorinated hydrocarbons separated by the column packing.

19. A gas chromatographic system for determining the concentration of chlorinated hydrocarbons in landfill gas, said gas chromatographic system comprising:

a valve including first and second ports connectible to a source of the landfill gas, first conduit means including at least a first receiver, a third port connectible to a source of carrier gas, and a fourth port;

said valve including fifth and sixth ports connectible to a source of a second gas and second conduit means including a second receiver;

said valve having a load position in which said first and second ports are in communication through a flow path which includes said first conduit means and said first receiver and said fifth and sixth ports are in communication through a flow path which includes the second conduit means and the second receiver whereby the landfill gas and the second gas can be loaded into the first and second receivers, respectively, and an inject position in which the third and fourth ports are in communication through a flow path which includes the first and second receivers whereby the gases in the receivers can be carried by the carrier gas through the fourth port;

a gas chromatographic column and a column packing within the column capable of separating the chlorinated hydrocarbons in the landfill gas;

conduit means for coupling the fourth port to the column whereby the column can receive the carrier gas, the landfill gas and the second gas from the fourth port; and

means for detecting the concentration of the chlorinated hydrocarbons separated by the column packing.

4,521,226

METHOD OF AUTOMATICALLY CONTROLLING A DUST-COLLECTING PLANT

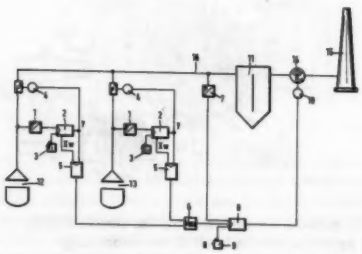
Franz Alig, Johannesberg; Horst Hemmerling, Kronberg, and Franz Neulinger, Erzhausen, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 6, 1984, Ser. No. 568,856

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301668

Int. Cl.³ B01D *47/00*

U.S. Cl. 55—21 **6 Claims**



1. In a method of automatically controlling a dust-collecting plant, in which a plurality of gas streams are sucked from spaced apart dust sources through a manifold to a dust-collecting unit and the gas is exhausted into an exhaust gas chimney by an automatically controlled exhaust fan, the improvement wherein: a vacuum at each dust source is maintained by an automatic control valve at a predetermined desired value r_i, the pressure drop R across the entire plant is initially adjusted to a predetermined value by an automatic control of the exhaust fan, and the pressure drop R is subsequently changed as follows:

(a) if the vacuum of at least one dust source is lower than r_i although the control valve is entirely opened, the desired value of the pressure drop R is increased until the predetermined vacuum values r_i are reached at all dust sources, and

(b) if the predetermined vacuum values r_i are reached at all dust sources and all control valves are partly closed, the desired value of the pressure drop R is decreased until the control valve of at least one dust source is entirely open.

4,521,227

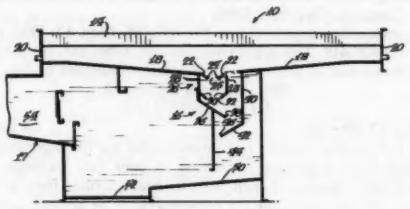
AIR WASHER FOR PAINT SPRAY BOOTH

Donald F. Gerdes, Park Ridge, and Steve E. Telchuk, Wheeling, both of Ill., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Filed Feb. 3, 1984, Ser. No. 576,561

Int. Cl.³ B01D *47/00*

U.S. Cl. 55—225 **18 Claims**



1. In a gas scrubbing device of the down draft type having means for flowing liquid downwardly through the device, means for drawing gas downwardly through the device, means for defining a first scrubber slot for passage therethrough of gas and liquid, an expansion chamber beneath the first slot having downwardly converging bottom walls forming a second scrubber slot below the first slot, a baffle sheet angling laterally downwardly beneath the second slot and cooperating with a spaced apart auxiliary wall to form a third scrubber slot; the improvement comprising:

a second baffle sheet angling downwardly below the third slot for impingement thereon of gas and liquid and for reception thereon of liquid discharged through the third slot; and

a second auxiliary wall extending downwardly below the first baffle sheet opposite the lower end of the second baffle sheet, the lower end of said second baffle sheet being spaced a short distance from said second auxiliary wall and forming therewith a fourth gas scrubber slot, the liquid leaving the first auxiliary wall being collected by said second baffle sheet and impinged thereby against said second auxiliary wall to form at said fourth slot at least one additional curtain of liquid for cleaning additional emissions from the gas.

4,521,228
CONTROL DEVICE FOR AN ELECTROSTATIC PRECIPITATOR

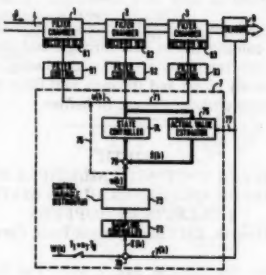
Horst Daar, Erlangen, and Franz Alig, Johannesberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, both of, Fed. Rep. of Germany

Filed Jul. 9, 1984, Ser. No. 628,777

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326041

Int. Cl.³ B03C *3/68*

U.S. Cl. 55—105 **4 Claims**



1. A device for controlling an electrostatic precipitator having a plurality of filter chambers connected in series to one another, effluent gases at the outputs of each of said chambers having a respective dust density, said plurality of chambers including an input chamber and an output chamber downstream thereof, said device comprising:

field generating means operatively linked to the filter chambers for generating therein electrostatic fields for the collection of dust particles from a stream of air flowing through said chambers;

current regulating means operatively coupled to said field generating means for controlling the flow of electrical current thereto and thereby partially determining the electric field density of the electrostatic fields in said chambers;

sensing means at the outlet of said output chamber for monitoring the dust content of outflowing gas of the precipitator; and

control means operatively linked to said current regulating means for supplying thereto control signals determinative of the amount of current to be fed to said field generating means, said control means including first computing means operatively tied to said sensing means for generating from the loop gains of said chambers and from the difference between a desired particle density of said outflowing gas and an actual particle density thereof detected by said sensing means electrical signals coding control variables representing at least in part desired particle densities at the outlets of said chambers, said control means further including estimating means for forming estimated actual particle densities of effluent gases at the outputs of said chambers, said control means further including second computing means operatively connected to said estimating means, said first computing means and said current regulating means for generating said control signals at least partially in response to the differences between desired particle densities calculated by said first computing means and respective estimated actual particle densities formed by said estimating means.

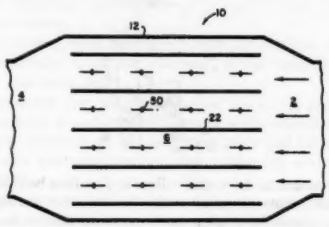
4,521,229
TUBULAR DISCHARGE ELECTRODE FOR ELECTROSTATIC PRECIPITATOR

Robert D. Baker, Vincent; Gerald W. Driggers, Cropwell; Ronald W. Gray, and Lawrence A. Hawkins, both of Birmingham, all of Ala., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 1, 1983, Ser. No. 547,802

Int. Cl.³ B03C *3/08, 3/41*

U.S. Cl. 55—137 **6 Claims**



1. An electrostatic precipitator comprising:

a. a housing defining a precipitator chamber therein and having a dirty gas inlet and a clean gas outlet for conveying a horizontal flow of gas to be cleaned through the precipitator chamber;

b. a collecting electrode assembly comprised of a plurality of collecting electrode plates disposed within the precipitation chamber in spaced vertical planes parallel to the direction of gas flow therethrough;

c. a discharge electrode assembly to which a voltage is applied to generate an electrostatic field comprised of a plurality of discharge electrode subassemblies disposed parallel to and alternately intermediate between collecting electrode plates, each discharge electrode subassembly supporting a plurality of spaced vertically extending discharge electrode members, each of said discharge electrode members comprising an elongated hollow tube extending along a vertically disposed longitudinal axis and having a transverse cross-section having an ellipsoidal configuration, and a plurality of corona discharge pins disposed at spaced intervals along the length of said hollow tube and extending outwardly therefrom in a plane parallel to the collecting electrode plates; and p1 d. said hollow tube discharge electrode members disposed with the longer axis of the ellipsoidal cross-section thereof perpendicular to said collecting electrode plates and the shorter axis of the ellipsoidal cross-section thereof parallel to said collecting electrode plates.

5. A discharge electrode for an electrostatic precipitator comprising:

a. an elongated hollow tubular member extending along a longitudinal axis and having a transverse cross-section having an ellipsoidal configuration; and

b. a plurality of elongated corona discharge pins disposed at spaced intervals along the length of said elongated tubular member and extending outwardly therefrom at an acute angle with respect to the longitudinal axis of said elongated tubular member in a plane through the shorter axis of the ellipsoidal cross-section of said elongated tubular member.

4,521,230
SELF-CLEANING FURNACE FILTER CONSTRUCTION

John C. Strong, 25 Comanche Trail, Malvern, Ohio 44644

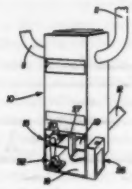
Filed Jul. 26, 1984, Ser. No. 634,598

Int. Cl.³ B01D *46/38*

U.S. Cl. 55—274 **8 Claims**

1. A self-cleaning filter construction for use in a forced air

system of the type in which air is moved by a blower from the system to a remote position through ducts, including a system chamber through which air to be moved passes, a pair of roller members mounted on opposite sides of the chamber, a generally horizontally oriented endless belt-type filter extending and movable between and around the rollers, said filter thereby presenting two surfaces substantially entirely across the chamber and in the path of air flow to filter entrained particles from



the air means to drive said rollers and endless belt filter, suction manifold means mounted within the chamber having a first and second manifold header, each manifold header having a suction manifold opening, one of said manifold openings being located adjacent to one of the filter surfaces, and the other of the manifold openings being located adjacent to the other of the filter surfaces, and means for applying a suction force to each of said manifold openings.

4,521,231

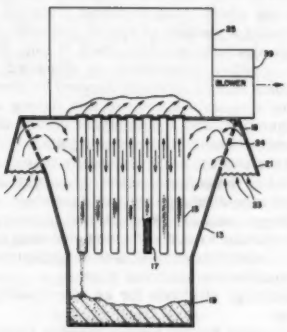
HIGH CAPACITY GAS FILTER SYSTEM

Norman Z. Shilling, Lancaster, Pa., assignor to General Electric Environmental Services, Inc., Lebanon, Pa.

Filed Nov. 10, 1983, Ser. No. 550,694

Int. Cl.[3] B01D *46/04*

U.S. Cl. 55—302 **13 Claims**



1. A high capacity gas filter comprising

a particulate collector hopper;

a housing mounted on said hopper and communicating therewith, said housing comprising

wall means extending outwardly and upwardly from said hopper;

a rigid sheet having a plurality of orifices therein;

gas permeable means interconnecting the upper edges of said wall means about the perimeter of said rigid sheet so as to provide a circumferential gas passage;

a plurality of frames supported by said rigid sheet and extending downwardly from said orifices and into said housing;

a filter bag surrounding each of said frames, the filter bag extending through the housing and terminating at the lower end of the housing;

a clean air plenum mounted above said rigid sheet; and

means for causing gas to pass into said housing through said circumferential gas passage, downwardly and inwardly along said filter bags, through said filter bags and into said plenum without the use of baffles.

9. A high capacity gas filter comprising

a particulate collector hopper;

a housing having outwardly extending walls mounted on said hopper;

an open hood mounted on said walls about the upper perimeter of said housing so as to provide a circumferential gas passage between the exterior and interior of said housing;

a tube sheet having a plurality of orifices therein mounted on top of said hood so as to cover said housing;

a plurality of frame supported elongated filter bags extending downwardly into said housing from each of said orifices, said filter bags terminating at the lower end of the housing;

a clean air plenum mounted above said rigid sheet; and

means for causing gas to pass through said circumferential passage into the upper area of said housing, downwardly and inwardly along and through said filter bags and into said plenum without the use of baffles.

4,521,232

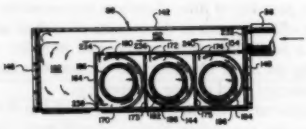
AIR FILTER UNIT WITH MULTIPLE FILTER CHAMBERS AND PARTICULATE MATERIAL COLLECTION HOPPERS

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Division of Ser. No. 223,036, Jan. 7, 1981, Pat. No. 4,434,861. This application Oct. 11, 1983, Ser. No. 521,980

Int. Cl.[3] B01D *50/00*

U.S. Cl. 55—324 **11 Claims**



1. Apparatus for collection of particulate material from a continuous flow stream of air or the like, comprising:

a housing including an air inlet chamber formed therein including means defining a separation chamber for separating relatively coarse particulate material from an air flow stream entering said inlet chamber;

means forming an inlet opening into said inlet chamber for conducting an air flow stream laden with particulate material entrained therein into said inlet chamber;

partition means in said housing defining a filter element chamber;

an air filter element disposed in said filter element chamber;

an outlet means for conducting air having passed through the filter element from the housing;

a first opening formed in said partition means for conducting at least a portion of said air flow stream entering said inlet chamber into said filter element chamber, said first opening being disposed so as to divert a lower velocity portion of said air flow stream into said filter element chamber;

said partition means including a second opening for conducting a portion of said air flow stream from said separation chamber into said filter element chamber;

said separation chamber including a first hopper portion for receiving particulate chamber separated from said flow stream, and means for discharging particulate material from said first hopper portion;

a second hopper portion positioned and arranged for receiving particulate material from said filter element chamber, said second hopper portion being separate from said first hopper portion;

a third hopper portion positioned and arranged for receiving

particulate material from said inlet chamber, said third hopper portion being separate from said second hopper portion; and

means for discharging particulate material from said third hopper portion into said second hopper portion, said means comprising one way door means between said second and third hopper portions.

4,521,233

DISC COVER FOR A FRYING PAN OR VESSEL

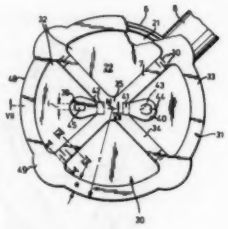
Franz Vossen, Radolfzell, Fed. Rep. of Germany, assignor to Meurer NonFood Product GmbH, Radolfzell, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,842

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1982, 3212646; May 6, 1982, 3216952

Int. Cl.³ B65D *51/16*

U.S. Cl. 55—384 **5 Claims**



1. A disc-shaped cover for a frying pan comprising a disc including a carrier ring, a plurality of spoke-shaped radial arms connected to said ring and defining open sectors therebetween, said arms having opposed radial edges, and a central region in which said radial arms merge, and a steampermeable filter of fibrous material secured to said disc on one side thereof to cover said open sectors, said filter being secured to said disc by a permanent adhesive means, said arms each having at least one transverse relief cut extending from one radial edge of the respective arm partially across the width of the arm to form a weakening zone permitting limited change in shape of the arm, said adhesive means between the filter and disc being reduced to a narrow zone at said relief cuts to leave an unadhered zone between the filter and disc adjacent said narrow zone.

4,521,234

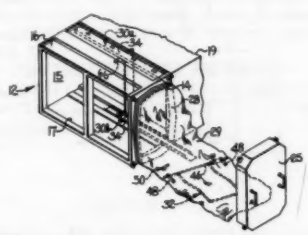
HOUSING FOR HIGH EFFICIENCY PARTICULATE AIR FILTERS

William C. Peebles, Jr., and Cecil W. Bowers, both of Washington, N.C., assignors to Flanders Filters,Inc., Washington, N.C.

Filed Jul. 19, 1983, Ser. No. 515,370

Int. Cl.³ B01D *46/00*

U.S. Cl. 55—481 **18 Claims**



1. In a rectangular filter housing comprising two pairs of opposite side walls, open front and rear ends defining the air flow direction therebetween, a side access door opening in one of said side walls for receiving at least one filter into the interior of the housing and subsequently removing the filter therefrom, sealing means in the housing for engaging one face of each filter therein, and a filter clamping assembly adapted for seating and unseating each filter against said sealing means, the improvement wherein said filter clamping assembly is releasable and removable from the housing to thereby facilitate its repair or replacement, and comprises

a pair of clamping mechanisms, with each of said mechanisms including

(a) a mounting plate having a length sufficient to extend substantially across the side wall of the housing adjacent said door, and

(b) a pressure bar mounted to said mounting plate for movement in a direction laterally with respect to the length direction of said mounting plate and between a laterally extended position and a laterally withdrawn position,

actuating means operatively connected to each clamping mechanism for selectively moving the associated pressure bar laterally between said extended and withdrawn positions, and

means releasably mounting each of said clamping mechanisms to respective ones of the two opposite side walls adjacent said door opening and so that said mechanisms extend transversely across the interior of the housing in general alignment with the door opening, said mounting means including at least one post fixed to each associated side wall of the housing, and an aperture in each mounting plate for receiving said post,

whereby each of said clamping mechanisms and said actuating means may be selectively removed from the interior of the housing.

4,521,235

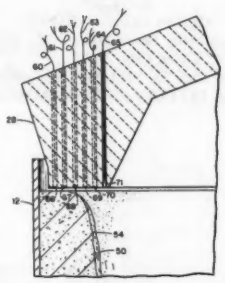
METHOD AND APPARATUS FOR CONTROLLING WALL LAYER THICKNESS IN A LIQUEFACTION PROCESS

Robert B. Heithoff, LaVale, Md., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 25, 1983, Ser. No. 555,243

Int. Cl.³ C03B *9/14*

U.S. Cl. 65—29 **9 Claims**



1. A method of thermally liquefying pulverulent materials comprising: maintaining a lining of pulverulent material on a support surface, feeding pulverulent material onto the lining to form a transient layer thereon, heating the transient layer so as to liquefy the transient layer and cause it to flow off the lining, determining the thickness of the lining by measuring temperature at a location spaced from and facing an end of the lining so as to detect temperature changes corresponding to changes in thickness of the lining, and adjusting operation of the lique-

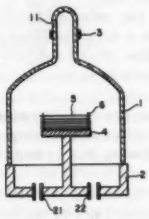
faction process in responses to the measured temperature so as to maintain controlled liquefying conditions.

4,521,236

METHOD FOR PREPARATION OF POROUS GLASS FILM

Minoru Yamamoto, Aichi; Jiro Sakata, and Haruo Doi, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Sep. 2, 1983, Ser. No. 528,789
Claims priority, application Japan, Sep. 6, 1982, 57-154823
Int. Cl.³ C03C *25/06*
U.S. Cl. 65—31 9 Claims



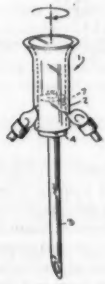
1. A method for preparing a porous glass film comprising:
forming a glass film from sodium borosilicate glass having a composition which can be phase-separated by heat-treatment into a soft phase easily elutable with a hot acid solution and a hard phase not easily elutable with the same solution;
heating said glass film to separate the glass phase into said soft and hard phases;
removing said soft phase from said glass film by eluting the same with said hot acid solution; and
subjecting said glass film to plasma etching in an atmosphere containing at least one gaseous fluorine-containing compound before or after said acid elution of the soft phase to remove the surface layers of said glass film, thereby providing a porous glass film having smooth surfaces and a uniform pore diameter throughout from the surfaces to the inside of said glass film.

4,521,237

GLASS DOSE SYRINGE

Emanuel N. Logothetis, Short Hills, N.J., assignor to Kahle Engineering Co., Union City, N.J.

Filed May 23, 1983, Ser. No. 496,929
Int. Cl.³ C03B *29/00*; A61M *5/32*
U.S. Cl. 65—42 11 Claims



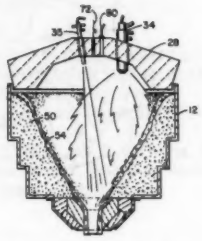
6. A process of making a disposable single use syringe body adapted to receive a complementary plunger having a one unit charge therebetween comprising:
insertably fusing in first sequence a hollow hypodermic needle into a first right circular cylindrical hollow glass tube,
insertably fusing in second sequence said first tube into a second right circular hollow cylindrical glass tube having walls of uniform thickness and a flared end of open construction adapted to receive in sequence said charge and said plunger.

4,521,238

METHOD AND APPARATUS FOR CONTROLLING AN ABLATION LIQUEFACTION PROCESS

Robert B. Heithoff, LaVale, Md., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 25, 1983, Ser. No. 555,256
Int. Cl.³ C03B *5/14*
U.S. Cl. 65—135 24 Claims



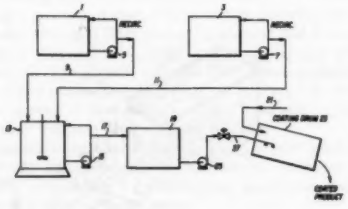
1. A method of liquefying pulverulent material comprising:
feeding pulverulent material onto a melting surface facing a central cavity within a vessel, directing thermal energy toward a major portion of the melting surface from primary combustion means so as to liquefy the material, draining liquefied material from the melting surface through a drain opening at a bottom portion of the cavity, and directing a combustion gas stream from secondary combustion means to a selected minor portion of the vessel interior in the region of the drain opening and below the region toward which the primary combustion means is directed so as to increase pressure in that portion.

4,521,239

COATING AGENT FOR PARTICULATE MATERIALS

Douglas P. Simms, Jackson, Miss., and Joseph M. Dobbs, Austin, Tex., assignors to Mississippi Chemical Corporation, Yazoo City, Miss.

Filed Nov. 29, 1982, Ser. No. 444,882
Int. Cl.³ C05C *1/00*
U.S. Cl. 71—27 20 Claims



1. A particulate fertilizer provided with a protective coating, comprising:
particles of a fertilizer coated with the reaction product of at

least one amine compound which is a primary, secondary or tertiary, straight or branched hydrocarbon chain amine or an amine containing a cyclic hydrocarbon radical and a siloxane having lower alkyl, lower alkoxy, lower alkylamino and/or amino substitution.

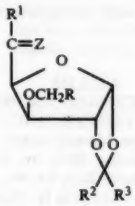
4,521,240

5-C-ALKYL-3-O-ARYLMETHYL OR SUBSTITUTED ARYLMETHYL-1,2-O-ALKYLIDENE-α-D-XYLO-PENTODIALDOFURANOSE HERBICIDE DERIVATIVES

William Loh, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 29, 1983, Ser. No. 489,981
Int. Cl.³ A01N *43/08*; C07H *17/04*
U.S. Cl. 71—88 **20 Claims**

1. A compound having the formula:



(I)

wherein:

R is monosubstituted phenyl having its single substituent selected from the group of lower alkyl, and halo;

R^1 is methyl or ethyl;

R^2 and R^3 are independently selected from the group consisting of hydrogen, or lower alkyl; and

Z is oxo or

17. A method for treating undesired vegetation which comprises supplying an herbicidally effective amount of a compound of claim 1 to the foliage or growth medium of said vegetation.

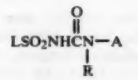
4,521,241

HERBICIDAL BENZENESULFONAMIDES

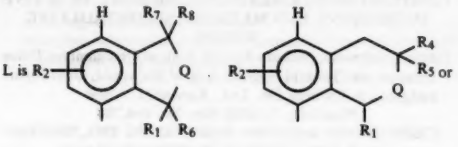
James V. Hay, Newark, and Richard F. Sauers, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 19, 1983, Ser. No. 533,773
Int. Cl.³ C07D *409/12, 405/12, 401/12*; A01N *47/36*
U.S. Cl. 71—92 **18 Claims**

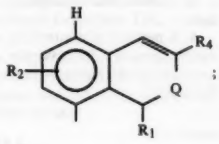
1. A compound having the formula:



where



L-1 L-2



L-3

Q is O, $S(O)_n$ or NR_3;

n is 0, 1 or 2;

R_1 is H, CH_3, Cl or F;

R_2 is H, Cl, Br, C_1–C_3 alkoxy or CF_3;

R_3 is H or C_1–C_4 alkyl;

R_4 is H or CH_3;

R_5 is H or CH_3;

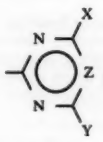
R_6 is H, Cl or F;

R_7 is H, Cl or F;

R_8 is H, Cl or F;

R is H or CH_3;

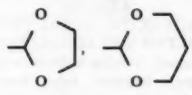
A is



A-1

X is F, Cl, Br, C_1–C_2 alkyl, C_1–C_2 alkoxy, OCF_2H or CF_3;

Y is H, NH_2, $NHCH_3$, $N(CH_3)_2$, C_1–C_4 alkyl, C_1–C_4 alkyl substituted with 1-3 atoms of (a) F, (b) Cl or (c) Br, CH_2OCH_3, $CH_2OC_2H_5$, C_1–C_4 alkoxy, C_1–C_2 alkylthio, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, $OCH_2CH_2OCH_3$, OCH_2CH_2F, OCH_2CH_2Cl, OCH_2CH_2Br, OCH_2CF_3, $CH(OCH_3)_2$, $CH(OC_2H_5)_2$,



or GCF_2T;

G is O or S;

T is H, CHClF, CHBrF, CF_2H or $CHFCF_3$;

Z is CH;

provided that:

(1) when X is F, Cl or Br, then Y is NH_2, $NHCH_3$, $N(CH_3)_2$, CH_3, OCH_3 or OCF_2H; and

(2) when R_1 is F or Cl, then R_6, R_7 and R_8 are the same as R_1 and Q is O or S; and when R_1 is H or CH_3, then R_6, R_7 and R_8 are H;

and their agriculturally suitable salts.

4,521,242

SUBSTITUTED PHENYL CARBAMATES, HERBICIDAL COMPOSITIONS CONTAINING THE SAME AS ACTIVE INGREDIENT AND METHOD OF CONTROLLING WEEDS

Tetsuo Takematsu; Makoto Konnai, both of Utsunomiya; Takeo Hosogai, and Takashi Nishida, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Aug. 3, 1982, Ser. No. 404,780
Claims priority, application Japan, Oct. 26, 1981, 56-171619
Int. Cl.³ A01N *47/22*; C07D *295/20*
U.S. Cl. 71—94 9 Claims

3. 2,4-dichloro-5-propargyloxyphenyl 1-piperidinecarboxylate.

4. A method of controlling weeds which comprises applying to the area in which weeds are to be controlled an effective amount of 4-chloro-3-propargyloxyphenyl 1-pyrrolidinecarboxylate.

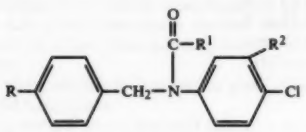
4,521,243

N-CARBONYL-N-(4-SUBSTITUTED BENZYL)-4-CHLOROANILINES

Don R. Baker, Orinda, and Teresa M. Tam, Vallejo, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

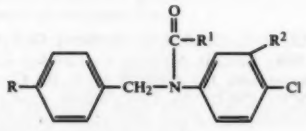
Filed Dec. 15, 1983, Ser. No. 561,854
Int. Cl.³ A01N *37/00, 37/18*; C07C *155/02*
U.S. Cl. 71—100 10 Claims

1. A compound having the structural formula



wherein R is nitro, chlorine or hydroxy; R^1 is C^1–C^4 alkyl or methylthio; and R^2 is hydrogen or chlorine.

6. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of a compound having the formula



wherein R is nitro, chlorine or hydroxy; R^1 is C_1–C_4 alkyl or methylthio; and R^2 is hydrogen or chlorine.

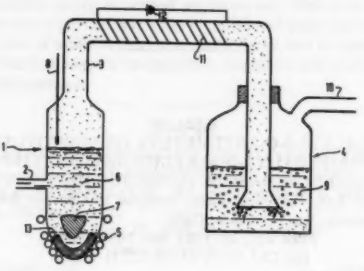
4,521,244

PROCESS OF PRODUCING METAL POWDERS FROM A MOLTEN METAL MATERIAL

Albert-Gilbert Goursat, Voisins-le-Bretonneux; Gilles Vernet, Paris; Jean-Francis Rimbert, Igny; Jean Foulard, Ablon; Thierry Darle, Versailles, and Jean Bigot, Crosne, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Apr. 24, 1984, Ser. No. 603,491
Claims priority, application France, May 4, 1984, 83 07414
Int. Cl.³ B22F *9/00*
U.S. Cl. 75—0.5 B 21 Claims

1. In a process for producing a metal powder, comprising putting a metal material heated to such temperature that the vapour pressure thereof is at least 1 mm of mercury in contact with a cryogenic fluid in the liquid phase in a closed treatment vessel so as to lower the temperature of said vapour and convert said vapour into solid particles, exhausting from said vessel the cryogenic fluid which contains said solid particles in suspension, separating said particles from said fluid, and collecting them so as to obtain said metal powder; the improvement wherein said metal material is induction heated with a high-frequency current and maintained in levitation in said cryogenic liquid.



4,521,245

METHOD OF PROCESSING SULPHIDE COPPER- AND/OR SULPHIDE COPPER-ZINC CONCENTRATES

Vladimir I. Yarygin, ulitsa Novoshkolnaya, 56, kv. 13.; Jury I. Sannikov, prospekt Lenina, 58/1, kv. 22.; Anatoly I. Panchenko, ulitsa Karbysheva, 26/1, kv. 98.; Anatoly P. Sychev, prospekt Lenina, 60, kv. 16.; Ivan G. Vikharev, ulitsa Kosmicheskaya, 5/1, kv. 20.; Vyacheslav P. Kuur, ulitsa Stakhanovskaya, 59/1, kv. 18., and Mels Z. Toguzov, prospekt Lenina, 24, kv. 14., all of Ust-Kamenogorsk, U.S.S.R.

Filed Nov. 2, 1983, Ser. No. 548,200
Int. Cl.³ C22B *15/00*
U.S. Cl. 75—21 10 Claims

1. A method of processing sulphide copper- and/or sulphide copper-zinc concentrates, comprising:

(a) flash smelting, in the presence of oxygen, of a mixture of said concentrates and fluxes selected from the group consisting of basic fluxes and basic fluxes in combination with silicate fluxes; thereby producing a dispersed mixture of highly basic molten slag containing copper and zinc oxides, metallic copper or white matte; said initial concentrates and fluxes being fed for smelting in such ratios that permit production of highly basic slag;

(b) effecting reduction of said copper and zinc oxides, contained in said highly basic molten slag, by means of a solid carbonaceous material with the resultant formation of a vapour-gas mixture, metallic copper and impoverished highly basic slag containing not more than 18 percent by weight of silicon dioxide;

(c) oxidizing the resultant vapour-gas mixture, containing zinc vapour, to zinc oxide;

(d) collecting the resultant zinc oxide.

4,521,246

OPERATING A BLAST FURNACE WITH THE INJECTION OF HOT REDUCING GASES

Nikolas G. Ponghis, Neuville-en-Condroz, and Arthur G. Poos, Embourg, both of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Continuation of Ser. No. 356,792, Mar. 10, 1982, abandoned. This application Sep. 6, 1983, Ser. No. 529,656
Claims priority, application Belgium, Mar. 11, 1981, 887905
Int. Cl.³ C21B *5/06*
U.S. Cl. 75—42 9 Claims

1. A method of operating a blast furnace having a plurality

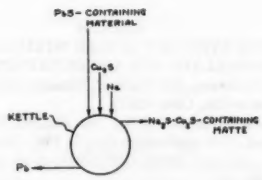
of peripherally spaced tuyeres for feeding gaseous agents into said blast furnace, said tuyeres being located at one level, comprising dividing said plurality of tuyeres into a first group of tuyeres and a second group of tuyeres, injecting through said first group of tuyeres hot reducing gases having a temperature in the range of about 1500° C. to about 2800° C. and consisting essentially of CO and H_2 with small amounts of CO_2 and H_2O, and simultaneously injecting through said second group of tuyeres an oxidizing blast gas consisting essentially of hot air.

4,521,247

LOW TEMPERATURE, NON-SO_2 POLLUTING, KETTLE PROCESS FOR SEPARATION OF LEAD FROM LEAD SULFIDE-CONTAINING MATERIAL

Carl R. Di Martini, Piscataway; Herbert E. Howe, North Plainfield, both of N.J.; William L. Scott, Tampa, Fla., and Leo J. Bulvanoski, Fords, N.J., assignors to ASARCO Incorporated, New York, N.Y.

Continuation of Ser. No. 319,556, Nov. 9, 1981, abandoned, which is a continuation of Ser. No. 132,239, Mar. 20, 1980, Pat. No. 4,333,763. This application Mar. 21, 1983, Ser. No. 475,210
The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.
Int. Cl.³ C22B *13/00*
U.S. Cl. 75—77 **4 Claims**



1. A process for separating lead from a material containing lead sulfide whih comprises:

(a) reacting in a kettle a mixture comprising molten lead, lead sulfide and copper sulfide with metallic alkali metal;

(b) the metallic alkali metal reacting with the lead sulfide to reduce the combined lead of the lead sulfide to metallic lead and forming a matte phase comprising a sulfur compound of the alkali metal and the copper sulfide separating from the molten lead;

(c) the thus-liberated metallic lead reporting in the molten lead, and the sulfur compound of the alkali metal and the copper sulfide being present in the matte phase; and

(d) separating the matte phase from the lead phase.

4,521,248

PROCESS FOR PRODUCING TITANIUM NITRIDE BASE CERMETS WITH HIGH TOUGHNESS

Yoshihiro Yamamoto, Iwakura; Junichiro Suzuki, Gifu, and Minoru Nakamura, Komaki, all of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation-in-part of Ser. No. 473,653, Mar. 9, 1983,. This application Aug. 20, 1984, Ser. No. 642,946
Claims priority, application Japan, Mar. 16, 1982, 57-41555
Int. Cl.³ C22C *1/05*; B22F *3/16, 1/00*
U.S. Cl. 75—238 **22 Claims**

1. A process for producing titanium nitride base cermet with a high toughness comprising the steps of:

admixing 0.5 to 10 parts volume of a carbon powder with a cermet material powder in an amount of 100 parts by volume based on nitrides in the cermet material powder, the cermet material powder essentially consisting of, by weight, 40 to 93% TiN, 2 to 15% of one or more selected from the group consisting of metals of the Group VIa of the periodic table and carbides thereof, 4.7 to 35% of iron group metal, and 0.3 to 10% of AlN with the balance being inevitable impurities,

forming the resultant mixture into a compact, and

sintering the resultant compact,

whereby, when said resultant compact is sintered, said AlN is substantially decomposed.

4,521,249

SILICATE CONTAINING AGENT AND CEMENT SURFACE MODIFIED WITH SAID AGENT

Masamichi Obitsu, Chiba; Takahiro Hori, Funabashi; Toyoji Koinuma, Tokyo, and Yuriko Sakaguchi, Funabashi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 400,820, Jul. 22, 1982, Pat. No. 4,443,496. This application Dec. 30, 1983, Ser. No. 567,028
Claims priority, application Japan, Jul. 30, 1981, 56-119751
Int. Cl.³ C04B *31/00*
U.S. Cl. 106—12 **11 Claims**

1. An agent for modifying a surface layer of cement structures, which comprises 100 parts by weight of an alkali silicate solution and 0.02 to 1 parts by weight of a water soluble condensate of sodium naphthalene sulfonate and formaldehyde, in which said alkali silicate solution has a SiO_2/M_2O mole ratio of 1 to 50, wherein M represents an alkali metal atom, or a substituted or unsubstituted ammonium cationic radical, and has a SiO_2 content of 5 to 30 weight %.

4,521,250

MIXTURE FOR PREPARATION OF PROTECTIVE AND INSULATING COATINGS ON METALS

Radomir Kuzel, Prague; Josef Broukal, Hradec Kralove, and Vaclav Bouse, Příbram, all of Czechoslovakia, assignors to Universita Karlova, Prague, Czechoslovakia

Filed May 10, 1984, Ser. No. 608,980
Claims priority, application Czechoslovakia, May 10, 1983, 3290-83
Int. Cl.³ C09D *5/14*
U.S. Cl. 106—15.05 **9 Claims**

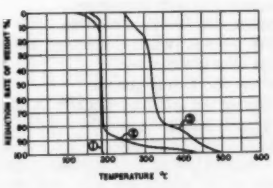
1. A mixture for preparation of protective and insulating coatings on metals and on metal products applied in the form of powder and pastes, said mixture consisting essentially of a residual amount up to 96% by weight of aluminum oxide, 1 to 70% by weight of barium oxide, 1 to 70% by weight of boron oxide, residual amounts to 30% by weight of silicon oxide and residual amounts up to 40% by weight of aluminum fluoride.

4,521,251

LOW-MELTING GLASS PASTE AND CELLULOSE NITRATE THEREFOR

Etsuo Otake, Yokohama; Mamoru Kimura, Himeji; Hiromu Yokota, Himeji, and Tetuo Kanematu, Himeji, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed May 6, 1983, Ser. No. 492,083
Claims priority, application Japan, May 17, 1982, 57-82832
Int. Cl.³ C08L *1/08, 1/18*
U.S. Cl. 106—183 **3 Claims**



1. A glass paste, comprising: glass frit having a softening point of up to 450° C., said glass frit being suspended in a

binder, said binder consisting essentially of a solution of high-nitrogen cellulose nitrate having a nitrogen content of from 12.2 to 14.1% and a degree of polymerization in the range of from 100 to 1,000, said high-nitrogen cellulose nitrate being dissolved in an organic solvent having a boiling point in the range of from 100° C. to 250° C.

4,521,252

PROCESS FOR PRODUCING A HIGH-PURITY ISOMALTOSE

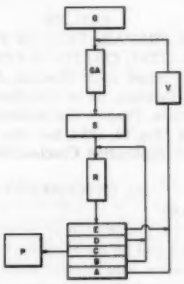
Toshio Miyake; Shuzo Sakai, and Takashi Shibuya, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Sep. 21, 1982, Ser. No. 420,702

Claims priority, application Japan, Oct. 26, 1981, 56-171179

Int. Cl.³ C13D *3/12, 3/14*

U.S. Cl. 127—46.3 **12 Claims**



1. A process for the separation of isomaltose from a feed solution by the utilization of an ion exchange resin, comprising:

(a) providing a feed solution containing at least 7% isomaltose based on the weight of the dry solid, the remainder consisting essentially of glucose and isomaltodextrins;

(b) sequentially admitting predetermined volumes of the feed solution and water to a column of a strongly acidic cation exchange resin having sulphonyl groups of an alkali metal or alkaline earth metal form;

(c) sequentially separating the effluents from the column into the following fractions:

a first fraction rich in isomaltodextrins,

a second fraction rich in isomaltodextrins, but highly contaminated with isomaltose,

a third fraction rich in isomaltose,

a fourth fraction rich in isomaltose, but highly contaminated with glucose, and

a fifth fraction rich in glucose;

(d) recovering the third fraction rich in isomaltose;

(e) sequentially admitting into the column:

the second fraction obtained in the step (c),

a feed solution having an isomaltose content of at least 7% based on the weight dry solid, and the remainder consisting essentially of glucose and isomaltodextrins;

the fourth fraction obtained in the step (c) and water; and

(f) repeating steps (c), (d) and (e) in a cyclic manner.

4,521,253

RUST REMOVAL PROCESS

Eugene S. Barabas, Watchung, N.J., assignor to GAF Corporation, Wayne, N.J.

PCT No. PCT/US83/00418, § 371 Date Sep. 27, 1983, § 102(e) Date Sep. 27, 1983, PCT Pub. No. WO83/03429, PCT Pub. Date Oct. 13, 1983

Continuation-in-part of Ser. No. 364,000, Mar. 31, 1982, Pat. No. 4,424,079, and a continuation-in-part of Ser. No. 454,127, Dec. 29, 1982, Pat. No. 4,451,296. This PCT application Mar. 24, 1983, Ser. No. 538,954

The portion of the term of this patent subsequent to Jan. 3, 2001, has been disclaimed.

Int. Cl.³ C23G *1/02*

U.S. Cl. 134—3 **15 Claims**

1. Process for removing rust from a rusty metal surface which compises:

(a) applying to said rusty surface a layer of rust removal coating composition consisting essentially of an aqueous solution or dispersion of water soluble or water dispersible copolymer of maleic acid and unsaturated monomer; and

(b) allowing said layer of coating composition to dry whereby rust becomes incorporated into said layer and the layer containing the rust detaches itself from the surface.

4,521,254

CLEANING CONTACT LENSES WITH SOLUTION OF BROMELAIN AND CARBOXYPEPTIDASE

Ronald L. Anderson, and Maria R. Mascio, both of 525 Sunbury Rd., Westerville, Ohio 43081

Continuation-in-part of Ser. No. 232,392, Feb. 9, 1981, abandoned. This application Feb. 5, 1982, Ser. No. 346,013

Int. Cl.³ B08B *3/08;* **C12N** *9/48, 9/50*

U.S. Cl. 134—26 **13 Claims**

1. The method of treating an extended wear contact lens by removing surface deposits and penetratingly adhering aggregations of physiologically encountered debris from said lens comprising:

(a) soaking the lens in an aqueous solution which comprises a principal proportion of bromelain active enzyme and an additional proportion of carboxypeptidase active enzyme suspended in the same aqueous solution and controlling said soaking for a period of time sufficient for the removal of all of the debris from said lens;

(b) rinsing said lens with a separate solution of distilled water; and

(c) placing said lens in a normal saline solution; whereby, said lens becomes cleansed of said deposits and debris.

4,521,255

METHOD FOR WASHING A FIBROUS MAT

Willard E. Raymor, 547 NW. Pacific Ave., Chehalis, Wash. 98532, and Peter L. Hedegard, 16800 NE. 31st St., Bellevue, Wash. 98001

Filed Jul. 25, 1983, Ser. No. 517,252

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—33 **7 Claims**

1. A method for removing particles from a fibrous mat, said method comprising:

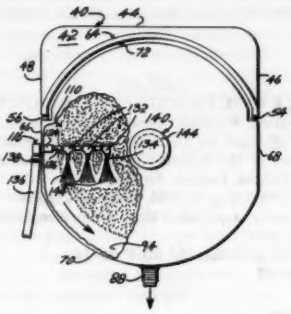
a. positioning said fibrous mat on a support;

b. said fibrous mat being, substantially, coplanar while positioned on the support and having an external dimension many times greater than the thickness of said fibrous mat;

c. said fibrous mat having a first surface and a second surface on a side of the mat opposite said first surface;

d. directing an aqueous medium to said fibrous mat to contact said first surface and to contact said second sur-

face to remove said particles from said fibrous mat and to rotate said fibrous mat while positioned on the support at



a speed sufficient to cause said particles to leave said fibrous mat due to centrifugal force.

4,521,256

METHOD OF MAKING INTEGRATED DEVICES HAVING LONG AND SHORT MINORITY CARRIER LIFETIMES

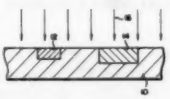
Shunichi Hiraki, Hiratsuka; Hiroshi Kinoshita, Yokohama; Kuniaki Kumamaru; Shigeo Koguchi, both of Kitakyushu, and Toshio Yonezawa, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

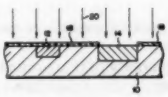
Filed Sep. 13, 1983, Ser. No. 531,620

Claims priority, application Japan, Sep. 16, 1982, 57-161243

Int. Cl.³ H01L *21/265, 7/00*

U.S. Cl. 148—1.5 **7 Claims**





1. A process for producing a semiconductor device, comprising the steps of:

irradiating with a radiation beam the entire surface of a semiconductor substrate having a p-n junction, thereby shortening a minority carrier lifetime;

selectively implanting ions in a region wherein the minority carrier lifetime is to be recovered; and

annealing the resultant structure.

4,521,257

PROCESS OF MANUFACTURING STRIP COATED WITH PRECIOUS METAL AS A SEMIFINISHED PRODUCT FOR MAKING ELECTRIC CONTACTS

Hans-Jürgen Gevatter, Heidelberg; Bernhard Müller, Keltern-Ellmendingen, and Hans-Joachim Neese, Eisingen, all of Fed. Rep. of Germany, assignors to Doduco KG Dr. Eugen Durrwachter, Pforzheim, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,661

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206262

Int. Cl.³ C25D *5/50, 7/06;* **B41B** *3/00*

U.S. Cl. 148—11.5 Q **18 Claims**

1. The method of manufacturing a semi-finished coated strip material to be used for manufacturing electrical contacts, the strip comprising a base metal substrate made of copper or a copper alloy, a surface layer made of precious metal or a precious metal alloy on selected portion of the substrate and an intermediate layer consisting of a base metal forming a diffusion barrier therebetween, comprising the steps of

depositing said intermediate layer on said substrate strip,

electro-despositing said surface layer on said selected portions of the substrate strip above said intermediate layer,

subjecting the coated strip to at least one heat treatment resulting in a recrystallization of said substrate, said intermediate layer and said surface layer, and

cold-rolling the coated strip so that its thickness is reduced by 10 to 50 percent of the thickness it had before the rolling operation.

4,521,258

METHOD OF MAKING WROUGHT HIGH TENSION STEEL HAVING SUPERIOR LOW TEMPERATURE TOUGHNESS

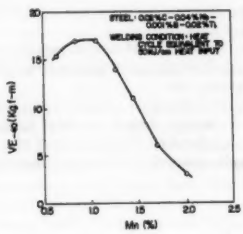
Hiroshi Tamehiro; Hiroo Mazuda; Mamoru Ohashi, all of Kimitsu, and Yasumitsu Onoe, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 424,780, Sep. 27, 1982, abandoned. This application Dec. 16, 1983, Ser. No. 562,250

Claims priority, application Japan, Oct. 31, 1981, 56-174950

Int. Cl.³ C21D *8/02*

U.S. Cl. 148—12 F **10 Claims**



1. A method of making wrought high tension steel having superior strength, toughness, and weldability which comprises the steps of:

preparing a steel consisting essentially by weight of; 0.005–0.12% C, not more than 0.6% Si, 0.6–1.4% Mn, not more than 0.005% S, 0.005–0.08% Al, 0.01–0.08% Nb, 0.0005–0.002% B, 0.004–0.03% Ti, not more than 0.006% N, at least one element by weight selected from the group consisting of; 0.01–0.08% V, 0.1–1.0% Ni, 0.1–1.0% Cu, 0.1–1.0% Cr, 0.05–0.3% Mo, 0.0005–0.005% Ca, and 0.001–0.03% in total of rare earth metal or metals, and the remainder being Fe and incidental impurities and the Ti and N contained in the steel satisfy the relationship expressed by a formula

$$-0.01\% \leqq Ti - 3.4N \leqq 0.02\%;$$

heating the steel at a temperature within a range of 1,000°–1,200° C.;

rolling the steel with a rolling reduction of not less than 60% at a temperature range of not more than 900° C. and the temperature for terminating the rolling is kept within a range of 640°–850° C.;

cooling the steel, after it has been rolled down, to a predetermined temperature lower than 550° C. with a cooling rate within a range of 10°–40° C./sec.

4,521,259

NITROGEN ANNEALING OF ZIRCONIUM AND ZIRCONIUM ALLOYS

Craig M. Eucken, Linn County, Oreg., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 467,327, Feb. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 203,697, Nov. 3, 1980, abandoned. This application Sep. 17, 1984, Ser. No. 651,298

Int. Cl.³ C21D *1/56*

U.S. Cl. 148—20.3 **6 Claims**

1. A method of continuously annealing zirconium metal and its alloys comprising continuously passing the metal through an annealing furnace containing a nitrogen atmosphere while maintaining said metal at a temperature of from about 1000° F. to 1600° F. for from 0.5 to 10 minutes said time and temperature being inversely proportional and within the formula:

$$\text{Time} = a \times 2.7183^{(Q/R)\ 1/temp\ °K.}$$

wherein

$a = 3 \times 10^{-20} - 2 \times 10^{-13}$

$Q/R = 20{,}000\text{–}45{,}000.$

4,521,260

DETONATION-TRANSFER ENERGETIC COMPOSITION

Nancy C. Johnson, Waldorf, and Carl Gotzmer, Jr., Accokeek, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 26, 1984, Ser. No. 665,335

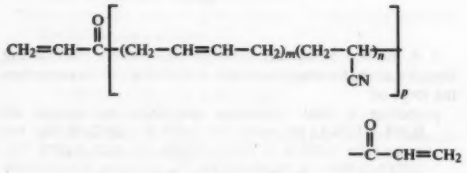
Int. Cl.³ C06B *45/10*

U.S. Cl. 149—19.91 **17 Claims**

1. An energetic composition which comprises, based on total composition weight,

from about 79 to about 84 weight percent of pentaerythritol tetranitrate having a particle size from about one to about four microns; and

from about 16 to about 21 weight percent of a binder system which comprises, based on total binder weight, from about 25 to about 60 weight percent of a vinyl-terminated polybutadiene-acrylonitrile copolymer represented by the formula



wherein m, n, and p have values such that the acrylonitrile content is from about 5 to about 20 percent, the vinyl equivalent weight is from about 1000 to about 1600, and the average molecular weight is from 2500 to about 5000; from about 25 to about 45 weight percent of a crosslinking monofunctional unsaturated ester selected from the group consisting of acrylates and methacrylates, and mixtures thereof, the amount of said ester being less than the amount of copolymer; from about 20 to about 50 weight percent of a plasticizer selected from the group consisting of dioctyl phthalate, maleate and adipate, isodecyl pelargonate, dibutyl phthalate and maleate and mixtures thereof; from about 0 to 1 weight percent of an antioxidant; and from about 0 to about one weight percent of a wetting agent.

4,521,261

DOUBLE BASE PROPELLANT COMPOSITIONS

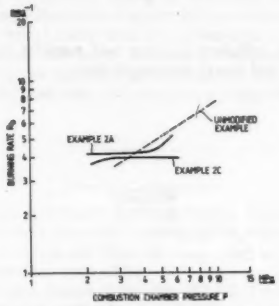
David G. Davies, Waltham Abbey, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 8, 1984, Ser. No. 638,856

Claims priority, application United Kingdom, Aug. 12, 1983, 8321754

Int. Cl.³ C06B *25/34*

U.S. Cl. 149—92 **18 Claims**



1. A double base propellant composition comprising nitrocellulose, nitroglycerine and a ballistic modifier, said modifier comprising at least one lead compound and at least one copper (II) salt of an aliphatic dicarboxylic acid.

4,521,262

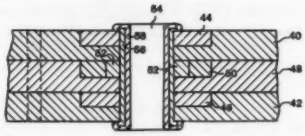
METHOD FOR MASS PRODUCING PRINTED CIRCUIT BOARDS

Peter P. Pellegrino, 216 Edgewood La., Apple Valley, Minn. 55124

Filed Jan. 10, 1983, Ser. No. 439,333

Int. Cl.³ C25D *7/00*; B05D *5/00*; C23F *1/02*; B44C *1/22*

U.S. Cl. 156—150 **10 Claims**



1. A method of making multilayer printed circuit boards comprising

(a) fabricating a plurality of thin printed circuit board layers for later laminating into a multilayer board, each printed circuit board layer being fabricated by the steps of

(i) providing a printed a circuit board blank having an electrically insulative substrate with a predetermined repetitive and interconnected conductive pattern on one surface thereof,

(ii) coating the conductive pattern with a photoresist,

(iii) exposing and developing the photoresist in a predetermined pattern to remove photoresist from those interconnects desired to be opened, and from the conductive pattern in isolation locations in accordance with a pre-

determined through hole pattern and in locations where board layer interconnection to that circuit is not desired, and in an amount to substantially exceed the through hole size to be later drilled,

(iv) removing the exposed interconnects and isolation locations whereby the remaining portions of said predetermined repetitive and interconnected conductive pattern provides the desired circuit pattern,

(b) aligning the plurality of printed circuit board layers with respect to each other and laminating the layers together using a laminating adhesive which will fill the isolation locations,

(c) drilling the multilayer board to provide the predetermined through hole pattern, and

(d) through plating the through holes with a conductive material, thereby for each hole, making electrical interconnection between all conductive patterns through which the respective through hole passes.

4,521,263

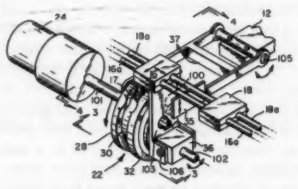
AUTOMATIC SPLICING DEVICE AND PROCESS

Joshua Benin; Helen R. Delp, both of Newark, Del., and Leland L. Krauss, Aston, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 408,418, Aug. 16, 1982, abandoned. This application Aug. 3, 1984, Ser. No. 637,581

Int. Cl.³ A61M *5/00;* **B29C** *27/00*

U.S. Cl. 156—159 **12 Claims**



1. A process for forming a connection between two thermoplastic tubes being held in a side-by-side relationship in a pair of displaced mounting blocks movable relative to each other and movable with respect to a heated cutting means between the blocks comprising: passing the cutting means through the tubes; shifting the blocks to align two different cut tube ends facing each other while maintaining contact between the cut tube ends and the cutting means; and withdrawing the cutting means from contact with the tubes while urging the blocks together, said passing, shifting and urging steps being pivotal orthogonal motions; and controlling the timing of said process to automatically obtain said connection.

2. An apparatus for forming a connection between two thermoplastic tubes comprising: a pair of displaced mounting blocks for holding said tubes in a side-by-side relationship; a heated cutting means located between the blocks, said blocks being movable with respect to each other and with respect to the cutting means; means for providing movement between said mounting blocks and said cutting means, said means for providing movement generating three pivotal orthogonal motions; and a controller coupled to the means for providing movement to control the timing of the operation of the apparatus.

4,521,264

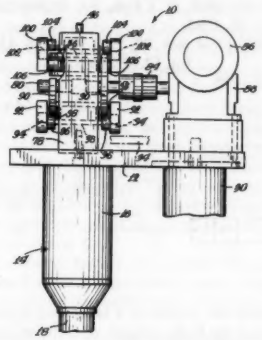
METHOD AND APPARATUS FOR INTERNALLY CUTTING A TUBE OF MATERIAL

Martin Mueller, Wonder Lake, Ill., assignor to Osgood Industries, Inc., Northbrook, Ill.

Continuation-in-part of Ser. No. 451,401, Dec. 20, 1982,. This application May 27, 1983, Ser. No. 498,981

Int. Cl.³ B23D *21/14*

U.S. Cl. 156—184 **20 Claims**



1. An apparatus for cutting a tube of spirally wound material into segments, comprising:

mandrel means upon which said tube of material is spirally wound so that said tube is relatively axially advanced along said mandrel means;

cutter means mounted within said mandrel means including blade means adapted for movement inwardly and outwardly of said mandrel means;

means for cyclically operating said cutter means so that said blade means internally cuts said tube of material into said segments,

said cutter means comprising cutter arbor means rotatably mounted in said mandrel means, blade actuating means disposed within said cutter arbor means and adapted for rotation therewith, and blade means operatively connected with said blade actuating means,

said blade means including a cutting portion adapted for reciprocable movement inwardly and outwardly of said mandrel means attendant to relative axial movement of said blade actuating means and said cutter arbor means,

means for rotating said cutter arbor means and said blade actuating means comprising cutter drive means rotatably mounted in said mandrel means, said cutter drive means supporting said cutter arbor means for rotation within said mandrel means, said rotating means further comprising motor means for rotating said cutter drive means,

said cutter arbor means being mounted for reciprocable axial movement relative to said cutter drive means,

said operating means including cam means for first relatively axially moving said blade actuating means and said cutter arbor means for moving the cutting portion of said blade means outwardly of said mandrel means, said cam means thereafter moving said blade actuating means and said cutter arbor means axially relative to said mandrel means in the direction of tube advancement so that the cutting portion of said blade means moves axially with respect to said mandrel means in the direction of tube advancement during cutting of said tube of material,

said blade means comprising at least one flexible blade having one end connected to said blade actuating means, the other end of which provides said cutting portion,

said cutter arbor means including means for guiding said flexible blade so that relative axial movement of said blade

actuating means and said cutter arbor means is adapted to move said cutting portion inwardly and outwardly of said mandrel means.

4,521,265

PROCESS FOR PREPARING LAMINATED PLATE

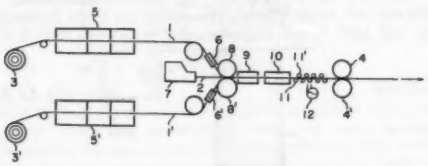
Ichikawa Kunihiko, Machida, and Mishima Kiyoshi, Hachioji, both of Japan, assignors to Mitsubishi Light Metal Industries Limited, Tokyo, Japan

PCT No. PCT/JP81/00352, § 371 Date Jul. 20, 1983, § 102(e) Date Jul. 20, 1983, PCT Pub. No. WO83/01756, PCT Pub. Date May 26, 1983

PCT Filed Nov. 20, 1981, Ser. No. 530,597

Int. Cl.³ B32B *31/22*

U.S. Cl. 156—229 **6 Claims**



1. A process for preparing a laminated plate by laminating metallic sheets on both surfaces of a thermoplastic synthetic resin sheet which comprises

(a) preheating two metallic sheets stretched under a constant tension;

(b) feeding said preheated metallic sheets and said synthetic resin sheet in a molten state to place said synthetic resin sheet between said metallic sheets, between heat-press rolls;

(c) passing said laminated plate among a plurality of rolls arranged in zig-zag positions to form curves of said laminated plate in a degree less than its bending elastic limit; and

(d) cooling said laminated plate to a temperature of said synthetic resin to be at the softening point or lower on the rolls in step (c).

4,521,266

METHOD OF MANUFACTURING CORKS FOR BOTTLES

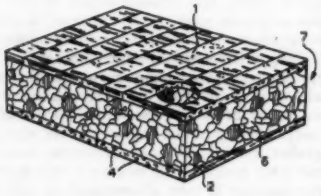
Franco Careddu, Canelli, Italy, assignor to Sugherificio P. Careddu S.p.A., Canelli, Italy

Filed Jul. 15, 1983, Ser. No. 514,124

Claims priority, application Italy, Jul. 15, 1982, 67903 A/82

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—242 **2 Claims**



1. A method of manufacturing corks comprising the steps of:

forming a first and a second sheet from strips of natural cork disposed side-by-side and glued together and with the pores of the cork extending parallel to the plane of the said sheet,

placing said first sheet on the bottom of a mold,

placing a mixture of granulated cork and binder in said mold on said first sheet,

placing said second sheet in said mold over said mixture of cork and binder,

pressing and baking in said mold the composite formed by said two sheets and mixture so as to form a parallelpipedal block having a control core of agglomerated cork and two major surfaces defined by said sheets,

smoothing said two major surfaces of said parallepipedal block, and

punching the said block in a direction perpendicular to its major surfaces to form the corks.

4,521,267

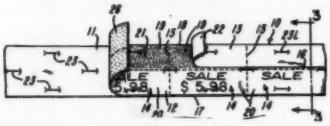
COMPOSITE LABEL WEB AND METHOD OF LABELING

David N. Jacobson, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jun. 21, 1984, Ser. No. 622,927

Int. Cl.³ B32B *7/06*

U.S. Cl. 156—249 **5 Claims**



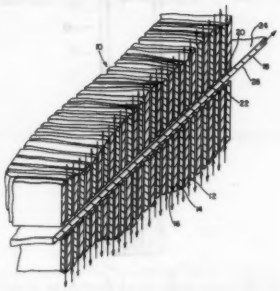
1. A flexible composite label web for use in a hand-held labeler having a delaminator comprising: a longitudinally extending carrier web, label material carried by the carrier web, cuts separating the label material into a series of labels, a non-tacky adhesive releasably adhering the labels at their undersides to the carrier web, the carrier web having means in a predetermined relationship to the cuts for registering the labels with respect to a label delaminator, a longitudinally extending line of weakening spaced from opposite side edges of the labels and separating the labels into detachably connected first and second label parts, pressure sensitive adhesive on the outer sides of the first label parts, the second label parts being free of adhesive and being adapted to have price data printed thereon, and masking material releasably adhered to a masking of the pressure-sensitive adhesive on the first label parts.

4. Method of labeling using a hand-held labeler having a label delaminator, comprising the steps of: providing a flexible composite label web including a longitudinally extending carrier web, label material carried by the carrier web, cuts separating the label material into a series of labels, a non-tacky adhesive releasably adhering the labels at their undersides to the carrier web, the carrier web having means in a predetermined relationship to the cuts for registering the labels with respect to a label delaminator, a longitudinally extending line of weakening spaced from opposite side edges of the labels and separating the labels into detachably connected first and second label parts, pressure sensitive adhesive on the outer sides of the first label parts, the second label parts being free of adhesive and being adapted to have price data printed thereon, and masking material releasably adhered to a masking of the pressure-sensitive adhesive on the first label parts, providing a labeler having a label delaminator and a toothed driver disposed downstream of the delaminator, threading the carrier web through the labeler to guide the carrier web to the delaminator and thereafter a position in which the carrier web can engage the toothed driver, operating the labeler to dispense one or more labels, removing the masking material from a dispensed label, and attaching the first label part to the underside of a marginal edge of a tag so that the second label part with the price data projects beyond the tag.

4,521,268
APPARATUS FOR DEPOSITION OF FLUID AND GASEOUS MEDIA ON SUBSTRATES

Edward Bok, Burgemeester Amersfoordtlaan 82, 1171 dr Badhoevedorp, Netherlands

Division of Ser. No. 491,318, Apr. 25, 1983, Pat. No. 4,495,024.
This application Jul. 9, 1984, Ser. No. 629,303
The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.
Int. Cl.³ B44C *1/22*; B08B *5/04*; C23C *13/08*; B05D *5/12*
U.S. Cl. 156—345 39 Claims



1. Apparatus for longitudinal transport and processing of substrates comprising:

a. a housing;

b. an upper block and a lower block superposed with respect to each other and supported by said housing so as to define an elongated longitudinal passage between the opposed faces of said upper block and said lower block;

c. at least one fluid medium supply channel defined within one of said blocks and communicating with a fluid medium supply at one end and extending at its other end into said longitudinal passage, and

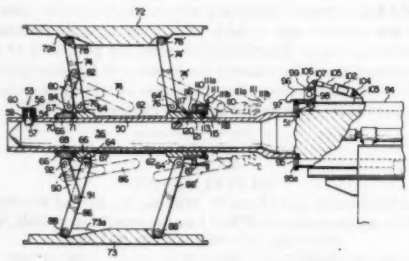
d. at least one fluid medium discharge channel defined in one of said blocks and extending into said longitudinal passage;

said supply channel and said discharge channel being positioned so that over at least part of said passage fluid cushions are maintained on both sides of the substrates within said passage.

4,521,269
TIRE BUILDING APPARATUS

Chiaki Ozawa, Kodaira, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 23, 1983, Ser. No. 565,175
Claims priority, application Japan, Dec. 27, 1982, 57-234713
Int. Cl.³ B29H *17/16*
U.S. Cl. 156—420 5 Claims



1. A tire building apparatus comprising,

an axially elongated drive shaft extending in a longitudinal direction of said apparatus and rotatable about its center axis;

a tire building drum comprising an axially elongated retainer sleeve interchangeably received on said drive shaft and rotatable with said drive shaft about the center axis of said drive shaft, a slider sleeve slidably received on said retainer sleeve and rotatable with said drive shaft about the center axis of said drive shaft, a plurality of link members each pivotally connected at its one end to said slider sleeve, and a plurality of arcuate drum segments each equiangularly spaced apart from one another about the center axis of said drive shaft and pivotally connected with the other end of each of said link member, the arcuate drum segments forming a cylindrical shape when held in a radially outermost position with respect to said center axis of said axially elongated drive shaft;

a drive sleeve having an annular end plate fixedly connected thereto and movable along said axially elongated drive shaft with respect to said tire building drum and coaxially surrounding said axially elongated drive shaft;

at least an elongated clutch arm having at its one end a hook portion protruding outwardly of said annular end plate of said drive sleeve and at the other end pivotally connected to said drive sleeve; and

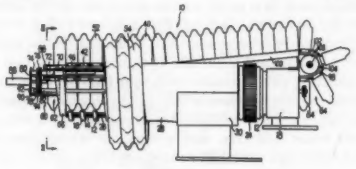
a cylindrical member having a horizontal base portion slidably received on said slider sleeve, and a flange portion radially outwardly extending with respect to said axially elongated drive shaft;

said flange portion of said cylindrical member having a front end face and a rear end face so that the rear end face is brought into engagement with said annular end plate of said drive sleeve while said tire building drum is radially outwardly expanding, and the front end face is brought into engagement with said hook portion of said elongated clutch arm while said tire building drum is radially inwardly contracting.

4,521,270
APPARATUS FOR FORMING SPIRALLY WOUND PIPE

Manfred A. A. Lupke, 92 Elgin St., Thornhill, Ontario, Canada L3T 1W6

Filed Feb. 24, 1984, Ser. No. 583,310
Claims priority, application Canada, Apr. 6, 1983, 425277
Int. Cl.³ B29D *23/04*
U.S. Cl. 156—429 9 Claims



1. An apparatus for use in the manufacture of spirally wound pipe, including a helical track and a plurality of independent moldblocks adapted to travel serially along the track so as to define a rotating and axially advancing mandrel surface, characterized by:

(a) the track having a hollow core; and

(b) a block return system comprising:

(i) a block return passage extending along the hollow core of the helical track,

(ii) run-out means for transferring the blocks serially from the helical track to the return passage at a downstream position,

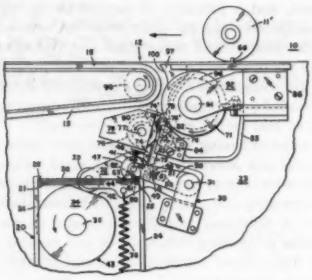
(iii) run in means for transferring the blocks serially from the return passage to the track at an upstream position, and serially through the block return system.

(iv) return drive means for driving the blocks serially through the block return system.

4,521,271
LABELING MACHINES

Helmut Voltmer, Park Ridge; Alfred F. Schwenzer, Totowa, and John D. Spano, Hasbrouck Heights, all of N.J., assignors to NJM, Inc., Fairfield, N.J.

Filed May 28, 1982, Ser. No. 382,940
Int. Cl.³ B65C 9/08
U.S. Cl. 156—568 12 Claims



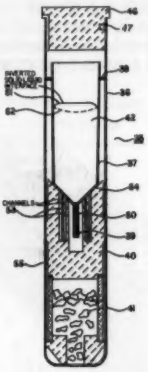
1. In a labeling machine, a hopper for carrying a stack of labels, a label applying station, and means for successively and positively feeding labels from said hopper to said applying station comprising a rotatable turret provided with suction means located adjacent to the leading edge of the terminal label in said hopper and adapted to lift by vacuum such leading label edge out of said hopper and then to mechanically withdraw such label from the hopper, said turret having a curved outer surface of which a portion is stepped inwardly to provide a turret section of reduced radius, including a step adapted to fit around an edge of said hopper, there being vacuum ports located on said curved outer surface behind said step to lift the edge of the label, said turret being supported by means which urge said turret away from said hopper to permit rotation of said turret, said labeling machine further comprising a first guide means defining a given path of travel for the label, a first pressure roll cooperating with said turret to mechanically draw such label from the hopper and to advance the leading edge thereof into the entry end of said first guide means, a rotatable feed roll and a second pressure roll located to coactively engage the label intermediate the ends of its given path through said first guide means and prior to the release of the label by said turret and said first pressure roll, a rotatable glue roll located to receive the label on its peripheral surface as the label is discharged from said first guide means, said turret and its coacting first pressure roll, said feed roll and its coacting second pressure roll, and said glue roll each imparting to the label during their mechanical feed thereof, a corresponding given linear velocity, and means for transferring the glued label from said glue roll to said applying station without substantially diminishing such given linear velocity thereof.

4,521,272
METHOD FOR FORMING AND GROWING A SINGLE CRYSTAL OF A SEMICONDUCTOR COMPOUND

William A. Gault, Ewing Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., New York, N.Y.

Division of Ser. No. 222,444, Jan. 5, 1981, Pat. No. 4,404,172.
This application Dec. 13, 1982, Ser. No. 449,311
Int. Cl.³ C30B 11/02
U.S. Cl. 156—616 R 1 Claim

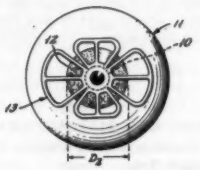
1. A gradient zone freeze method for growing single crystal semiconductor compounds in a crucible having a seed well, a transition region and a main growth region the seed well containing a seed crystal to promote single crystal growth and the transition region and main growth region containing the polycrystalline form of the desired semiconductor single crystal comprising heating the crucible so as to melt the polycrystalline compound and to create and maintain a steep temperature gradient of from 80° to 200° C. in the region of the seed well, a lesser temperature gradient of from 50° to 150° C. in the transition region and a still smaller temperature gradient of from 5° to 50° C. in the main growth region, slowly cooling the crucible while maintaining the temperature gradients so as to induce crystal growth along a solid-liquid interface initially at the top of the seed crystal and which slowly rises through the transition region and up and through the main growth region.



4,521,273
METHOD OF MAKING A LENS AND HAPTIC ASSEMBLY

Stanley Poler, 78 E. Second St., New York, N.Y. 10003

Division of Ser. No. 124,941, Feb. 26, 1980, Pat. No. 4,377,329.
This application Sep. 20, 1982, Ser. No. 420,108
Int. Cl.³ B44C 1/22; C03C 15/00, 25/06; B29C 17/08
U.S. Cl. 156—630 9 Claims



1. The method of making a lens and haptic assembly, which comprises selecting an optically finished lens element and two pieces of transparent sheet material of larger area than the area of the lens element, laminating the sheets to opposite sides of the lens element and to each other over a circumferentially continuous haptic area radially beyond the periphery of the lens element, and fenestrating the haptic area by photographically delineated milling after lamination of said sheet-material pieces to each other and to said lens element.

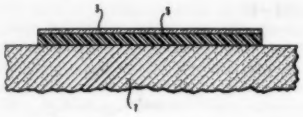
4,521,274
BILEVEL RESIST

Elsa Reichmanis, and Cletus W. Wilkins, Jr., both of Westfield, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

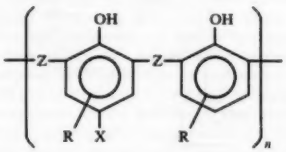
Filed May 24, 1984, Ser. No. 613,884
Int. Cl.³ B44C 1/22; C03C 15/00, 25/06; B29C 17/08
U.S. Cl. 156—643 12 Claims

1. A process of fabricating a device comprising the steps of forming a composition including a radiation-sensitive composi-

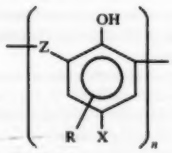
tion on a substrate, patterning at least a portion of said region and further processing said substrate
CHARACTERIZED IN THAT



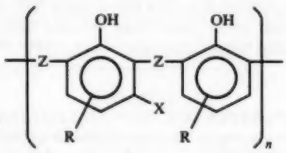
said region comprises a polymer that is represented by the formula



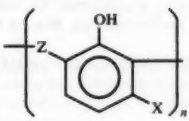
or



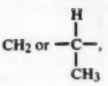
or



or



where Z is



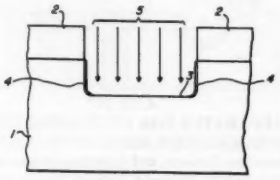
where R is hydrogen or methyl, and where X contains silicon and is chosen so that T_g of said composition is higher than 30° C., and the silicon weight percentage of said composition is at least 5.

4,521,275

PLASMA ETCH CHEMISTRY FOR ANISOTROPIC ETCHING OF SILICON

Andrew J. Purdes, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 395,205, Jul. 6, 1982, Pat. No. 4,450,042. This application Feb. 1, 1984, Ser. No. 576,050
The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.
Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*
U.S. Cl. 156—643 **14 Claims**



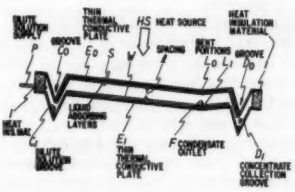
1. A method for anisotropic plasma etching of silicon-bearing material, comprising the steps of:
(a) flowing a gaseous mixture over said material, said mixture including compounds of bromine and chlorine; and
(b) exciting said mixture into a plasma over said material, said bromine compound characterized by plasma formation of bromine-bearing species which passivate said silicon on surfaces of said material not subject to said plasma's ion bombardment, and said chlorine compound characterized by plasma formation of chlorine-bearing species which volatilize silicon.

4,521,276

CONCENTRATING APPARATUS

Kenji Tsumura, Nishinomiya, and Masayuki Yamashita, Osaka, both of Japan, assignors to Oriental Metal Mfg. Co., Ltd., Hyogo, Japan

Filed Apr. 29, 1982, Ser. No. 373,155
Claims priority, application Japan, May 8, 1981, 56-69649
Int. Cl.³ B01D *1/22*
U.S. Cl. 159—1 W **10 Claims**



1. A concentrating apparatus comprising:
a first substantially planar rigid plate having high thermal conductivity and having a first surface adapted to receive heat from a heat source, said first plate having a second surface on the side opposite said first surface provided with a solution-absorbing layer for absorbing a solution supplied thereto for concentration;
a second substantially planar rigid plate having high thermal conductivity and positioned substantially parallel to said first plate and spaced therefrom, and having a first surface facing said second surface of said first plate and provided thereon with a condensate absorbing layer spaced from said solution absorbing layer, said second plate having a second surface on the side opposite said condensate absorbing layer adapted to dissipate heat;
said first and second plates each being formed with a first

groove near an edge thereof, said grooves being positioned in corresponding relation to one another, said groove in the lower of said two plates forming a solution supply groove and said solution absorbing layer being arranged to extend into said solution supply groove;

means for supplying a dilute solution to said solution supply groove to be absorbed by said solution absorbing layer; and

means for withdrawing concentrate and condensate from said apparatus.

4,521,277

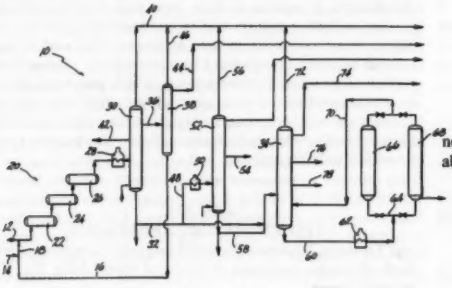
APPARATUS FOR UPGRADING HEAVY HYDROCARBONS EMPLOYING A DILUENT

Jose L. Calderon, Caracas, and Ignacio Layrisse, San Antonio de Los Astos Estado Miranda, both of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Feb. 9, 1983, Ser. No. 465,180

Int. Cl.³ C10G *33/00*

U.S. Cl. 196—46 **5 Claims**



1. An apparatus for upgrading a heavy crude oil feedstock characterized by a high specific gravity, high pour point, high viscosity and high metal, sulfur, water, salt and conradson carbon contents for making coke suitable for metallurgical purposes comprising:

(a) a heavy crude oil feedstock inlet line;

(b) a dehydrator downstream of said heavy crude oil feedstock inlet line for receiving crude oil therefrom;

(c) a diluent feed line for feeding a diluent to said heavy crude feedstock in said heavy crude oil feedstock inlet line upstream of said dehydrator;

(d) a desalter downstream of said dehydrator for receiving a mixture of crude oil and diluent from said dehydrator wherein the water content of the mixture of crude oil and diluent from said dehydrator is not more than 1.0 volume percent;

(e) a distillation unit downstream of said dehydrator for receiving a dehydrated and desalted mixture of crude oil and diluent from said desalter wherein said mixture of crude oil and diluent from said desalter has a salt content of not more than 5 PTB;

(f) a splitter means downstream of said distillation unit for receiving the overhead liquid hydrocarbon product from said distillation unit so as to obtain a narrow boiling point diluent; and

(g) feed lines for feeding said narrow boiling point diluent from said splitter means to said diluent feed line for mixing said diluent with said heavy crude feedstock prior to the dehydrating and desalting of said heavy crude oil and diluent mixture.

4,521,278

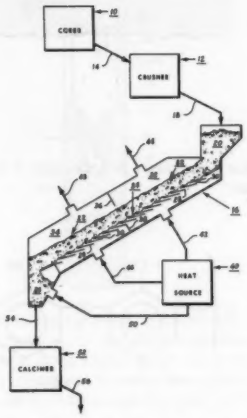
METHOD FOR PRODUCING NEEDLE COKE

Arnold E. Kelley, Orange; Michael J. Block, and Milan R. Skripek, both of Fullerton, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 26, 1983, Ser. No. 488,731

Int. Cl.³ C10B *49/06*

U.S. Cl. 201—17 **34 Claims**



1. A method for producing calcined needle coke from green needle coke having a Hardgrove Grindability Index above about 90 comprising:

(a) heating said green needle coke at temperatures between about 875° F. and about 1200° F. for a time between about 10 minutes and about 24 hours, said time being sufficient to effect a reduction in the friability of said green needle coke as determined by a decrease in said Hardgrove Grindability Index; and

(b) without first allowing the temperature of the heated green needle coke to cool below about 500° F., calcining the heated green needle coke obtained from step (a) at calcination temperatures above about 2000° F.

4,521,279

APPARATUS FOR DRY COOLING COKE

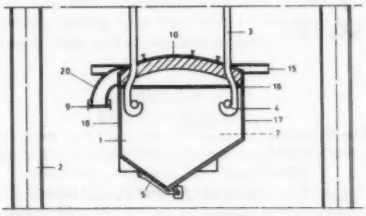
Kurt Lorenz, Hattingen; Engelbert Bruns, Recklinghausen, and Gerd Osterholt, Dorsten, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 465,254

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206938

Int. Cl.³ C10B *33/00, 39/00, 39/12*

U.S. Cl. 202—227 **3 Claims**



1. A bucket and exhaust line combination for handling hot

coke which is connectable to an exhaust system having the exhaust line, comprising a container having a bottom with a discharge opening, a bottom flap closing the discharge opening which is openable to release the coke from the bucket through the discharge opening, said container having an open top with a container rim surrounding the open top, a detachable cover closing the top having a cover rim resting on said container rim and sealing the interior of said container, an exhaust pipe carried by said cover and having one interior end opening into the interior of said cover and said container and an opposite exterior end terminating outside said cover in a downwardly extending exhaust connection for connecting said container to the exhaust line, at least one longitudinally extending girder secured to an exterior of said cover and having cover support portions extending beyond each side edge of said cover, said cover being convex and forming an interior raised portion over the container, said exhaust pipe connected into the interior of said cover adjacent a highest portion of the interior, a water seal having a portion connected to said exhaust line and a portion connected to said exhaust connection for sealing said exhaust line to said exhaust connection, said exhaust pipe extending horizontally from said cover and below a top of said cover, said exhaust pipe terminating at said downwardly extending exhaust connection, and a second longitudinally extending girder spaced laterally of said at least one longitudinally extending girder and having cover support portions extending beyond each side edge of said cover, said cover being convex in a central area thereof and having a pair of flat rim areas on opposite sides of said central area, said at least one longitudinally extending girder connected to a top of one of said flat areas and said second longitudinally extending girder connected to a top of the other flat area, a top of said central area of said cover being above a top of said at least one longitudinally extending girder and said second longitudinally extending girder.

4,521,280

METHOD OF MAKING PRINTED CIRCUITS WITH ONE CONDUCTOR PLANE

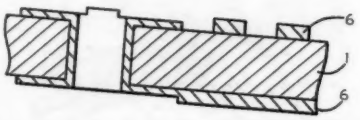
Dieter K. Bährle, Schönaich, and Friedrich W. Schwerdt, Herrenberg, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1984, Ser. No. 616,342

Claims priority, application European Pat. Off., Jun. 1, 1983, 83105433.3

Int. Cl.³ C25D *5/02, 7/00*

U.S. Cl. 204—15 **12 Claims**



1. Method of making printed circuits with one conductor plane, characterized by the following process steps:

(a) laminating a sacrificial foil onto a synthetic resin prepreg;

(b) drilling through-holes;

(c) etching off the sacrificial foil;

(d) laminating a negative photoresist foil onto the surface of the prepreg;

(e) exposure in accordance with the desired conductor pattern, and developing;

(f) sputtering copper on the surface of the photoresist, on the walls and the bottom of the photoresist channels defining the conductors, and on the surface of the drilled holes;

(g) lift-off of copper sputtered onto the surface of the photoresist;

(h) depositing copper on copper sputtered on the photoresist channels and the drilled holes, following the additive method; and

(i) stripping the photoresist.

4,521,281

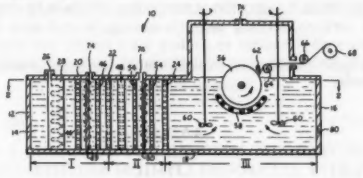
PROCESS AND APPARATUS FOR CONTINUOUSLY PRODUCING MULTIVALENT METALS

Igor V. Kadija, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 3, 1983, Ser. No. 538,299

Int. Cl.³ C25C *3/28, 7/00*

U.S. Cl. 204—25 **18 Claims**



1. A process for continuously producing a multivalent metal, said process comprising:

providing a cell having at least one non-metallic porous barrier for separating said cell into a plurality of zones;

introducing a metal species having a first state of valency into one of said zones;

electrolytically reducing said first metal species to a species having a next lower state of valency in said one zone;

passing said species having said next lower state of valency through said at least one non-metallic porous barrier into another of said zones; and

substantially continuously plating said metal onto a cathode in said another zone.

4,521,282

CYANIDE-FREE COPPER ELECTROLYTE AND PROCESS

Robert A. Tremmel, Woodhaven, Mich., assignor to OMI International Corporation, Warren, Mich.

Filed Jul. 11, 1984, Ser. No. 627,715

Int. Cl.³ C25D *3/38*

U.S. Cl. 204—52 R **20 Claims**

1. An aqueous cyanide-free electrolyte containing copper ions present in an amount effective to electrodeposit copper, a complexing agent present in an amount sufficient to complex an effective amount of the copper ions present, hydroxyl and/or hydrogen ions present in an amount to provide a pH of about 6 to about 10.5, and sulfamic acid and the bath soluble and compatible salts thereof present in an amount effective to increase the anode efficiency during the electrodeposition of copper from said electrolyte.

4,521,283

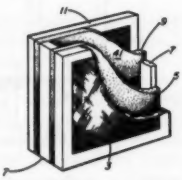
ELECTRO ORGANIC METHOD AND APPARATUS FOR CARRYING OUT SAME

Stanley R. Pickens, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 478,931, Mar. 25, 1983, Pat. No. 4,472,251. This application Sep. 7, 1984, Ser. No. 648,549

Int. Cl.³ C25C *1/00*

U.S. Cl. 204—59 R **10 Claims**



1. A method of electrolytically forming organic sulfur compounds selected from the group consisting of sulfides, sulfoxides, sulfonic acids and sulfonyls in an electrolytic cell having

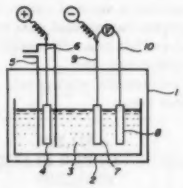
an anode, a cathode, and solid electrolyte means or solid electrolyte means having a porus non-electrode layer on said solid electrolyte means therebetween and in contact with the anode and the cathode, comprising contacting at least one of said anode and cathode with a gaseous sulfur compound selected from the group consisting of sulfur dioxide, sulfur trioxide, hydrogen sulfide, thionyl chloride and sulfuryl chloride, and a reducible organic compound selected from the group consisting of olefins having from 2 to 8 carbons, primary alcohols having from 1 to 6 carbons, secondary alcohols having from 3 to 6 carbons, tertiary alcohols having from 4 to 8 carbons, primary alkyl halides, secondary alkyl halides and aryl halides and imposing an electrical potential from the anode to the cathode.

4,521,284

ELECTROLYTIC METHOD OF PRODUCING A HIGH PURITY ALUMINUM-LITHIUM MOTHER ALLOY

Zenichi Tanabe; Katsuhisa Itoh, and Yoshiaki Watanabe, all of Nagoya, Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,554
Claims priority, application Japan, Nov. 18, 1983, 58-215989
Int. Cl.³ C25C *3/36*
U.S. Cl. 204—71 **4 Claims**



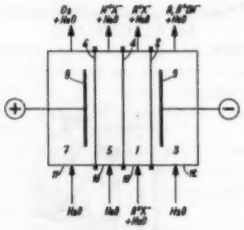
1. A method of producing a high purity aluminum-lithium mother alloy comprising electrolyzing a mixed molten salt consisting essentially of 34 to 64 wt. % of lithium chloride and 66 to 36 wt. % of potassium chloride under a cathodic current density in the range of 0.005 to 1 A/cm², using one or more solid aluminum cathodes, and thereby depositing aluminum-lithium alloys essentially free from alkali metals other than lithium on said cathodes.

4,521,285

ELECTROLYTIC PROCESS FOR THE PREPARATION OF ORGANIC COMPOUNDS

Paolo De Witt, via della Divisione Torino, 57 Rome, and Enrico Benedetto, via P. Ferraris 31, Domodossola Novara, Italy

Filed Nov. 15, 1983, Ser. No. 551,817
Claims priority, application Italy, Nov. 25, 1982, 24432 A/82
Int. Cl.³ C25B *3/00*; B01D *57/02*
U.S. Cl. 204—72 **16 Claims**



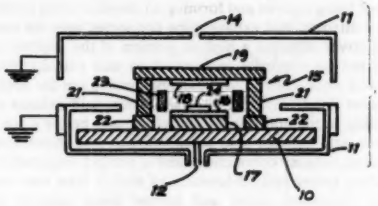
9. The method of forming a quaternary ammonium salt which comprises causing a quaternary ammonium organic ion to migrate through a cation exchange membrane inserted in a multi-compartment electrolytic cell from one side to the other side of said membrane, maintaining a reactive organic acid on said other side of the membrane and reacting said organic acid with said quaternary ammonium organic ion.

4,521,286

HOLLOW CATHODE SPUTTER ETCHER

Christopher M. Horwitz, Summer Hill, Australia, assignor to Unisearch Limited, Kensington, Australia

Filed Mar. 7, 1984, Ser. No. 587,123
Claims priority, application Australia, Mar. 9, 1983, PF8365
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 E **19 Claims**



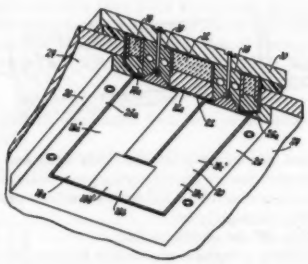
1. A dry process etching or deposition chamber comprising:
a vacuum chamber enclosing two radio frequency electrodes, one of which is formed as a hollow cathode
a source of radio frequency potential connected between said pair of electrodes;
inlet means for introducing a gas into the vacuum chamber, which gas becomes chemically reactive when ionized by a radio frequency discharge to perform etching and deposition processes upon target material positioned on internal surfaces of the hollow cathode.

4,521,287

HIGH RATE SPUTTERING OF EXHAUST OXYGEN SENSOR ELECTRODE

Howard D. Kisner, Wichita Falls, Tex., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 28, 1984, Ser. No. 625,846
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 SP **4 Claims**



1. In a method of DC magnetron sputtering of an exhaust electrode onto a given surface of a zirconia solid electrolyte exhaust gas oxygen sensor body, opposite from a surface on said body having a previously formed reference electrode, the improvement of:
providing a vacuum chamber having a sputtering cathode assembly that includes a platinum target face and a magnet pair producing a field strength of at least about 500 gauss between magnet poles adjacent the target face;
maintaining a pressure of about less than 10 millitorr in the

chamber, of an atmosphere consisting essentially of more than 50% by volume of at least one member selected from the group consisting of nitrogen and oxygen and the balance an inert gas;

disposing the sensor body on a conductive support which exposes the given surface for sputtering and permits the given and opposite surfaces to be maintained at relatively different electrical potentials, and the reference electrode being in low electrical resistance communication with the support, the support being allowed to electrically float with respect to the sputtering cathode and anode, the support being movable across the cathode target face;

sputtering the target face at a sputtering power of about 4–9 kilowatts; and

moving the support across the target face at a rate of about 5–10 cm per minute, effective to move the support through the sputtering region of the chamber and to concurrently deposit a porous platinum exhaust electrode onto the given surface of the sensor body and darken that surface, so that a sensor lean-to-rich response time of less than 100 microseconds and generally equal rich-to-lean response time can be obtained.

4,521,288

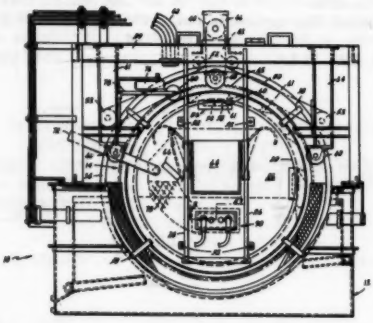
CATHODE STRUCTURE FOR CLEANING, PLATING AND/OR COATING APPARATUS

Robert McInnes, 4444 W. Bristol Rd., Flint, Mich. 48507

Continuation-in-part of Ser. No. 600,795, Apr. 6, 1984. This application May 5, 1984, Ser. No. 614,134

Int. Cl.³ C25D *17/20*

U.S. Cl. 204—213 **6 Claims**



1. In an apparatus for cleaning, plating and/or coating articles, the combination comprising:

a container adapted to contain a liquid treatment material,

a barrel adapted to be at least partially submerged in liquid in said container,

said barrel having a longitudinal axis,

means for rotatably supporting said barrel so that it is partially submerged in liquid in said container,

said barrel having a central opening in one end thereof,

an end wall mounted in fixed position covering the central opening in said one end of said barrel,

cathode structure comprising a cathode,

means fixedly mounting said cathode on the inner side of said end wall,

and a cable connector on the outer side of said end wall to which an electrical cable is adapted to be connected and having means forming an electrical connection with said cathode.

4,521,289

METHOD AND APPARATUS FOR INSTALLATION OF A MEMBRANE TO AN ELECTROLYTIC CELL

Tokuzo Iijima, Kobe; Toshiharu Yamamoto, Akashi; Kazuo Kishimoto; Takamichi Komabashiri, both of Takasago; Toshiji Kano, Kobe, and Akinori Hisanaga, Kakogawa, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

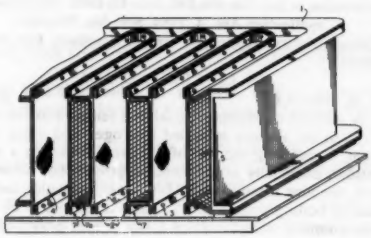
Continuation of Ser. No. 971,430, Dec. 20, 1978, Pat. No. 4,268,373. This application Apr. 24, 1981, Ser. No. 257,416

Claims priority, application Japan, Dec. 26, 1977, 52-178714[U]

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.³ C25B *9/00, 11/02, 13/02*

U.S. Cl. 204—253 **5 Claims**



2. A finger type electrolyte cell for the production of chlorine, hydrogen and an alkali metal hydroxide by electrolysis of an aqueous alkali metal chloride solution which cell comprises a plurality of anodes and cathode box providing a cathode between adjacent anodes, and a membrane between adjacent anodes and cathodes, further comprising upper and lower membrane installation frames having collars positioned so as to cover the upper and lower horizontal surfaces of the cathodes not opposing the anodes, cation exchange membranes in a cylindrical shape located substantially parallel to the vertical surfaces of the cathodes, and bolting means for installing and securing the membranes to the collars by bolting said bolting means including press plates with brims.

4,521,290

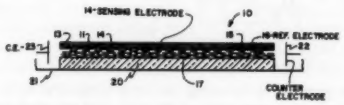
THIN LAYER ELECTROCHEMICAL CELL FOR RAPID DETECTION OF TOXIC CHEMICALS

Hanumanthiya V. Venkatasetty, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 16, 1984, Ser. No. 590,309

Int. Cl.³ G01N *27/54*

U.S. Cl. 204—412 **22 Claims**



1. A nonaqueous electrochemical cell sensor structure for detection of toxic gas or vapor molecules in the surrounding atmosphere comprising:

an enclosure for electrochemical cell means, said enclosure having an opening on one face for admitting gases and vapors to be sensed from the surrounding atmosphere;

a porous polymer membrane having an outer and an inner surface, a substantial portion of the inner surface of said membrane being coated with an inert thin conducting film which forms a sensing electrode, the outer surface at said opening being in communication with said atmosphere

which may at times contain molecules of gas or vapor sought to be detected;
a reference electrode fabricated on a separate portion of said inner surface by coating said membrane separate portion with a metal/metal ion film;
a counter electrode inert film located beyond the edge of said membrane and electrically separated from said sensing and reference electrodes; and,
a thin layer of nonaqueous electrolyte solution in said enclosure in contact with said electrodes.

4,521,291

COAL EXTRACTION

James W. Clarke, Tewkesbury; Geoffrey M. Kimber, Cheltenham; Terry D. Rantell, Cheltenham, and Colin E. Snape, Cheltenham, all of England, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 458,838, Jan. 18, 1983, abandoned. This application Apr. 4, 1984, Ser. No. 596,562

Claims priority, application United Kingdom, Feb. 9, 1982, 8203640

Int. Cl.³ C10G *1/00, 1/06*

U.S. Cl. 208—8 LE **6 Claims**

1. A method of extracting coal at a temperature of 400° to 500° C. in the absence of added hydrogen and using a liquid solvent, comprising the use of a solvent which is a mixture consisting essentially of an aromatic polycyclic hydrocarbon which contains three- and/or four-ring molecules and has a minimum boiling point of 270° C. and at least 25% by weight of the aromatic component of a naphthenic polycyclic high boiling hydrocarbon.

4,521,292

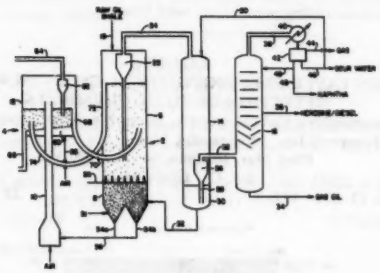
PROCESS FOR IMPROVING QUALITY OF PYROLYSIS OIL FROM OIL SHALES AND TAR SANDS

Byron G. Spars, Mill Valley; Robert J. Klett, San Francisco, and P. Henrik Wallman, Berkeley, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 27, 1982, Ser. No. 453,263

Int. Cl.³ C10G *1/00*

U.S. Cl. 208—11 R **10 Claims**



1. A process for retorting hydrocarbonaceous solid selected from the group consisting of oil shale and tar sand to recover pyrolysis oil of a lower average molecular weight and containing less contamination which comprises:
(a) mixing particulate raw hydrocarbonaceous solid with a particulate heat transfer material to raise the raw hydrocarbonaceous solid to a temperature sufficient to pyrolyze the hydrocarbonaceous fraction;
(b) pyrolyzing the hydrocarbonaceous fraction in a vertical retorting vessel by retaining the mixture of raw hydrocarbonaceous solid and hot particulate heat transfer material therein for a time sufficient to decompose a significant amount of hydrocarbonaceous fraction to form hydrocarbon vapors;
(c) passing a stripping gas through the mixture of hydrocarbonaceous solids and heat transfer material at a velocity sufficient to significantly lower the dew point of the evolved hydrocarbon vapors;
(d) recovering as pyrolysis products from the raw hydrocarbonaceous solid contaminated hydrocarbon vapors and a mixture of hot pyrolyzed solids and heat transfer material;
(e) condensing from said hydrocarbon vapors at a temperature of between 550° F. and 680° F. a high-boiling fraction containing concentrated contaminants, said high-boiling fraction being comprised of at least 90% hydrocarbons having a boiling point above 850° F.;
(f) contacting the contaminated high-boiling hydrocarbon fraction with the hot mixture of pyrolyzed solids and heat transfer material so as to thermally crack the high-boiling fraction and to deposit the contaminants along with coke on the mixture of particles; and
(g) withdrawing a product oil vapor of a lower average molecular weight and having substantially reduced contamination.

4,521,293

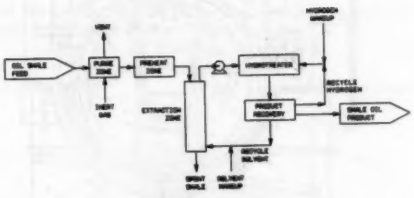
OIL RECOVERY

James Scinta, and Theodore M. Classen, both of Ste. 1107, 1825 K St. N.W., Washington, D.C. 20006

Continuation-in-part of Ser. No. 457,299, Jan. 11, 1983, abandoned. This application Jun. 7, 1984, Ser. No. 618,294

Int. Cl.³ C10G *1/04*

U.S. Cl. 208—11 LE **11 Claims**



1. A process for the recovery of hydrocarbons from oil shale containing said hydrocarbons comprising the steps of:
(1) heating said oil shale to a temperature of at least about 200° C. and at a low to moderate pressure ranging from atmospheric to 200 psia in the absence of a solvent or diluent to effect at least partial decomposition of the kerogen and the release of a significant portion of the hydrocarbons from the oil shale,
(2) contacting the heated oil shale in a countercurrent manner with a hydrocarbon solvent comprising alkanes and cycloalkanes having from 4–10 carbon atoms and aromatic compounds selected from benzene, toluene, xylene, naphthalene, substituted forms thereof, and mixtures thereof at a pressure from about atmospheric to about 500 psia and a temperature in the range of from about 100° to about 300° F. (38°–150° C.) for about 10 to about 300 minutes to yield a hydrocarbon extract, and
(3) hydrotreating the hydrocarbon extract of step (2) under supercritical solvent conditions.

4,521,294

STARTING PITCHES FOR CARBON FIBERS

Seiichi Uemura, Tokyo; Shunichi Yamamoto; Takao Hirose, both of Kamakura; Hiroaki Takashima, Kawasaki, and Osamu Kato, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1982, Ser. No. 366,937

Claims priority, application Japan, Apr. 13, 1981, 56-54305; Apr. 27, 1981, 56-62428; Jul. 27, 1981, 56-116331; Oct. 29, 1981, 56-172077

The portion of the term of this patent subsequent to Nov. 4, 1997, has been disclaimed.

Int. Cl.³ C10C *3/00*

U.S. Cl. 208—23 6 Claims

1. A starting pitch for carbon fibers, obtained by (A) mixing together 100 parts by volume of (1) a heavy fraction oil boiling at not lower than 200° C. obtained by fluidized catalytic cracking of petroleum with 10–200 parts by volume of (2) a hydrogenated oil selected from the group consisting of (a) aromatic nucleus-hydrogenated hydrocarbons prepared from aromatic hydrocarbons of 2–10 rings by hydrogenating the nuclei thereof, (b) a hydrogenated oil obtained by contacting a fraction boiling at 160°–650° C. obtained at the time of steam cracking of petroleum and/or a fraction boiling at 160°–650° C. obtained at the time of heat treating at 370°–480° C. a heavy fraction oil boiling at not lower than 200° C. obtained at the time of steam cracking of petroleum, with hydrogen in the presence of a hydrogenating catalyst to hydrogenate 10–70% of the aromatic nuclei of aromatic hydrocarbons contained in said fraction boiling at 160°–650° C. and (c) a hydrogenated oil obtained by contacting a fraction boiling at 160°–650° C. produced at the time of preparing the starting pitch by heat treatment, with hydrogen in the presence of a hydrogenating catalyst to hydrogenate 10–70% of the aromatic nuclei of aromatic hydrocarbons contained in said fraction boiling at 160°–650° C., to form a mixture of the oils (1) and (2), and then (B) heat treating the thus formed oil mixture at 370°–480° C. under a pressure of 2–50 $Kg/cm^2.G$, the starting pitch so obtained being heat treated to produce a precursor pitch which is melt spun, infusibilized, carbonized or graphitized to obtain the carbon fibers.

4,521,295

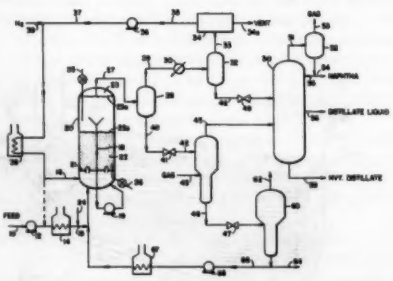
SUSTAINED HIGH HYDROCONVERSION OF PETROLEUM RESIDUA FEEDSTOCKS

Michael C. Chervenak, Pennington; Richard M. Eccles, Princeton, both of N.J., and Govanon Nongbri, Newtown, Pa., assignors to HRI, Inc., Gibbsboro, N.J.

Filed Dec. 27, 1982, Ser. No. 453,260

Int. Cl.³ C10G *65/10*

U.S. Cl. 208—59 17 Claims



1. A process for high conversion of petroleum residua containing at least about 25 V % material boiling above about 975° F. to produce lower boiling hydrocarbon liquid products, comprising the steps of:

(a) feeding a petroleum residua feedstock together with hydrogen into a reaction zone containing an ebullated catalyst bed, maintaining said reaction zone at 750°–900° F. temperature, 1000–5000 psig hydrogen partial pressure for liquid phase reaction to produce a hydroconverted material containing a mixture of gas and liquid fractions;

(b) separating said gas fraction from said liquid fractions while maintaining the liquid fraction temperature above about 730° F. to avoid precipitation of asphaltene compounds in the liquid;

(c) pressure-reducing said liquid fraction to a pressure below about 200 psig and flashing vapor from the liquid fraction while maintaining the resulting liquid temperature above a critical temperature of about 730° F. to avoid precipitation of asphaltenes; and

(d) distilling said liquid fractions from step (c) at a vacuum pressure to produce hydrocarbon liquid products having a boiling temperature below about 875° F.

4,521,296

PROCESS FOR THE PRODUCTION OF REFRIGERATOR OIL

Takatoshi Kunihiro, and Koji Tsuchiya, both of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Jun. 29, 1982, Ser. No. 393,464

Claims priority, application Japan, Jul. 2, 1981, 56-102253

Int. Cl.³ C10G *23/02*

U.S. Cl. 208—87 9 Claims

1. A process for producing a high quality refrigerator oil from a vacuum distillate having a boiling point in the range of from 270° to 510° C. obtained from a low grade naphthenic crude oil containing a fraction having a boiling point in the range of from 280° (5% point) to 510° C. (95% point), said fraction having a pour point of less than −20° C., a UOP characterization factor of from 11.20 to 11.45, a sulfur content of from 1.5 to 2.5% by weight, a nitrogen content of from 500 to 1,200 ppm, and a total acid value of from 5 to 9 mgKOH/g, which process comprises the steps of:

(1) contacting said vacuum distillate with a solvent to extract impurities thereby lowering the number of carbon atoms in aromatic ring structure per 100 carbon atoms (% C_A), as determined by a ring analysis, of said fraction to between 10 and 16;

(2) hydrogenating said solvent extracted fraction under the conditions of liquid hourly space velocity (LHSV) of from 0.1 to 0.7 per hour (hr^{-1}), pressure of from 40 to 100 kilograms per square centimeter (kg/cm^2), temperature of from 280° to 350° C., and hydrogen/oil ratio of from 70 to 200 normal cubic meter per kiloliter of oil (Nm^3/kl-oil) in the presence of a catalyst comprising molybdenum and at least one metal selected from the group consisting of nickel and cobalt impregnated on aluminum; and

(3) contacting said hydrogenated oil with a solid adsorbant to remove residual impurities and produce a high quality refrigerator oil having a pour point of less than −25° C., a cloud temperature of less than −15° C. and a hydrochloric acid generation amount as determined by the sealed tube test of less than 10 milligrams per 4 milliliters.

4,521,297

CATALYTIC CONVERSION OF SHALE OIL

Philip J. Angevine, West Deptford; Günter H. Kühl, and Sadi Mizrahi, both of Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,943

Int. Cl.³ C10G *11/05, 47/16, 69/06*

U.S. Cl. 208—89 14 Claims

1. A process for converting a feed selected from the group comprising hydrotreated shale oil, hydrotreated heavy shale oil, and gas oil to a fraction containing from about 50 percent to about 95 percent by weight of oil boiling in the 400°–650° F. boiling range comprising contacting said feed at a temperature

of about 650°–825° F., at a pressure of about 500–3000 psig, at a H_2/oil ratio of about 1000–10,000 SCF/B and at an LHSV of about 0.1 to 2.0 with a crystalline metallo-silicate zeolite having a constraint index of about 0.4 to about 5 made by steps comprising forming a reaction mixture containing sources of ions selected from an alkali metal or an alkaline earth metal, an organic nitrogen ion, a trivalent metal from one or more of Groups III through VIII of the Periodic Table, silicon and water, said mixture having the appropriate composition in terms of mole ratios of oxides to form said zeolite, reacting until crystallization is from about 20 percent to about 80 percent complete and adding a source of trivalent metal to the partially crystallized reaction mixture, thereby decreasing the silica-to-trivalent metal oxide ratio in the uncrystallized portion of said reaction mixture and forming an outer shell having the same trivalent metal and a lower silica-to-trivalent metal oxide ratio than the inner core, but having the same crystal structure.

4,521,298

PROMOTION OF CRACKING CATALYST OCTANE YIELD PERFORMANCE

Edward J. Rosinski, Pedricktown, N.J., and Albert B. Schwartz, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 170,220, Jul. 18, 1980, Pat. No. 4,309,280. This application Dec. 16, 1981, Ser. No. 331,428

The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.

Int. Cl.³ C10G *11/02*

U.S. Cl. 208—120 **20 Claims**

1. A process for catalytically cracking a hydrocarbonaceous feedstock comprising the step of contacting the feedstock in a reaction zone under catalytic cracking conditions in the absence of added hydrogen with a catalyst composition comprising a large pore size crystalline aluminosilicate and a matrix and a zeolite component, said zeolite characterized by a particle size less than 5 microns, a mole ratio of oxides of SiO_2:Al_2O_3 greater than about 500 and a Constraint Index of about 1 to 12, said zeolite not being intimately combined with a substantial amount of other solid prior to contact thereof with said catalyst composition, wherein the weight ratio of said zeolite to said large pore size crystalline aluminosilicate and matrix is in the range between about 1 to 10,000 and about 1 to 100.

4,521,299

REMOVAL OF BASIC NITROGEN COMPOUNDS FROM HYDROCARBON LIQUIDS

Edwin N. Givens, Bethlehem, and David S. Hoover, New Tripoli, both of Pa., assignors to International Coal Refining Company, Allentown, Pa.

Filed Oct. 31, 1983, Ser. No. 546,789

Int. Cl.³ C10G *25/00*

U.S. Cl. 208—254 R **6 Claims**

1. A method for reducing the concentration of basic nitrogen compounds in hydrocarbonaceous feedstock fluids comprising the steps of:

(a) providing anthracite coal having active basic nitrogen complexing sites on the surface thereof,

(b) contacting said anthracite coal with air, oxygen or oxygen-enriched air having an oxygen partial pressure of about 0.01 to 50 psi at a temperature of from sub-ambient to 500° F. to activate and form on the surface of said anthracite coal carboxylic acid moiety complexing sites,

(c) contacting said anthracite coal having said activated surface with said hydrocarbonaceous feedstock fluid containing said basic nitrogen compounds at a temperature ranging from ambient up to 500° F. to facilitate attraction of the basic nitrogen compounds to said carboxylic acid moiety complexing sites and formation and adsorption of said nitrogen compounds at said carboxylic acid moiety complexing sites on the surface of said anthracite coal, and

(d) subsequently separating said anthracite coal and the complexes formed thereon from the feedstock fluid to provide a hydrocarbonaceous fluid of reduced basic nitrogen compound concentration.

4,521,300

ORE FLOTATION WITH COMBINED COLLECTORS

Robert M. Parlman, and Clarence R. Bresson, both c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Division of Ser. No. 409,254, Aug. 18, 1982, Pat. No. 4,462,898. This application Feb. 29, 1984, Ser. No. 584,673

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—166 **12 Claims**

1. A composition consisting essentially of both of the following compounds in substantial quantities

(a) sodium isopropyl xanthate

(b) sodium n-butyl trithiocarbonate;

4,521,301

PROCESS OF PRODUCTION OF ORGANIC DITHIO-ACIDS AND THEIR APPLICATION

Jean-Louis Detienne, Pau; Guy Levesque, Ballon, and Pierre Tozzolino, Morlaas, all of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Division of Ser. No. 368,037, Apr. 13, 1982, Pat. No. 4,455,262. This application Mar. 5, 1984, Ser. No. 586,416

Claims priority, application France, Apr. 15, 1981, 81 07629

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—166 **6 Claims**

1. In a process of using a sulphur-containing material as a collector in the flotation of a mineral selected from the group consisting of galena, chalcopyrite and blende, the improvement which comprises employing as the collector a dithioic acid of the formula

$$RCS_2H$$

in which R is alkyl or alkenyl, linear or branched, of 4 to 20 carbon atoms which does not contain sulphur, or the sodium, potassium or ammonium salts thereof.

4,521,302

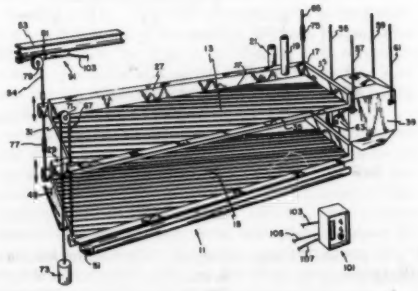
END ELEVATION ADJUSTMENT OF MATERIAL SEPARATING TABLES

Spencer A. Stone, 1405 Three Rivers, E., Fort Wayne, Ind. 46802

Filed Apr. 5, 1984, Ser. No. 597,178

Int. Cl.³ B03B *5/04*

U.S. Cl. 209—441 **8 Claims**



6. In a material separating system having a plurality of pendantly supported decks with head motion devices for impart-

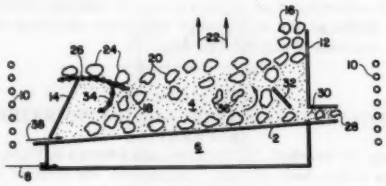
ing a reciprocatory motion to each deck to separate material mixtures supplied to the decks into at least two fractions, a first fraction having a specific gravity above a predetermined value and a second fraction having a specific gravity below the predetermined value, the improvement comprising a plurality of remotely actuable means each for modifying the attitude of a respective deck and therefore also the predetermined specific gravity value by changing the pendant support thereof, and a common control unit for simultaneously actuating the plurality of remotely actuable means to change in unison the separating gravities of respective decks.

4,521,303

SOLIDS SEPARATION IN A SELF-CIRCULATING MAGNETICALLY STABILIZED FLUIDIZED BED

Alfonza Hicks, Trenton, and Jerry E. Hankins, Orange, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 345,048, Feb. 2, 1982,. This application May 7, 1984, Ser. No. 607,409
Int. Cl.³ B03B *5/28*
U.S. Cl. 209—454 **12 Claims**



1. A process for separating a mixture comprising non-magnetizable solids according to the density of said solids which comprises:

(a) contacting said mixture with a separating medium comprising a magnetically stabilized fluidized bed containing an essentially fixed inventory of magnetizable particles circulating within a contacting zone such that the upper portion of said separating medium moves in a direction essentially opposite to that of the lower portion of said separating medium, both portions moving transverse to the flow direction of the fluidizing fluid leaving the upper surface of said separating medium, the circulation of said separating medium being initiated or maintained by the introduction of a fluid in a direction essentially transverse to the flow of the fluidizing fluid leaving the upper portion of the separating medium, said separating medium being stabilized by a magnetic means having a strength sufficient to suppress particle backmixing therein,

(b) separating said mixture into a less dense fraction comprising solids having a density less than the apparent density of the separating medium and a more dense fraction comprising solids having a density greater than the apparent density of the separating medium,

(c) conveying at least a portion of the less dense solids fraction with the upper portion of said separating medium and at least a portion of the more dense solids fraction with the lower portion of said separating medium by the circulatory motion of said separating medium, and

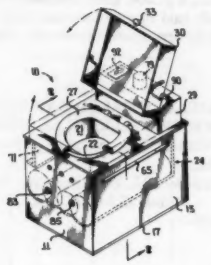
(d) withdrawing at least a portion of the less dense solids fraction from the upper surface of the separating medium and at least a portion of the more dense solids fraction from the lower portion of said separating medium.

4,521,304

APPARATUS FOR BIODEGRADING ORGANIC WASTE

Gary L. Yount, Gettysburg, Pa., assignor to Biocon, Inc., Gettysburg, Pa.

Filed May 3, 1982, Ser. No. 374,273
Int. Cl.³ A47K *11/02;* **C02F** *11/02*
U.S. Cl. 210—96.1 **25 Claims**



1. A toilet apparatus for biologically converting organic waste material substantially entirely into carbon dioxide, ammonia, and water, said toilet apparatus comprising:

a collecting vessel having a closed bottom, said vessel being adapted to contain a bed of activating conversion material supported by said closed bottom and having a top surface at a predetermined level in said vessel;

stirrer means disposed in said vessel for stirring a mixture of said conversion material and organic waste material admitted into said vessel, said stirrer means being disposed at least partially below said predetermined level; and

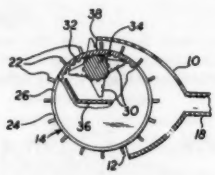
moisture control means for activating and de-activating said stirrer means as a function of the moisture content of said mixture, said moisture control means including a primary moisture sensor disposed in said conversion material in said vessel at a location below said predetermined height in said vessel.

4,521,305

ROTATING SELF-CLEANING SCREEN

Troy M. Deal, 277 Trismen Ter., Winter Park, Fla. 32789

Filed Mar. 28, 1984, Ser. No. 594,199
Int. Cl.³ B01D *33/06, 35/16*
U.S. Cl. 210—158 **4 Claims**



1. A self-cleaning screen for screening a flowing liquid comprising, in combination, a housing defining a flow path, a screen drum rotatably mounted within said housing about an axis transverse to said flow path and having a length and diameter substantially corresponding to the transverse cross-sectional height and width of the flow path, said screen drum having a circumference defined by a plurality of circumferentially spaced longitudinal elements substantially parallel to said axis and a plurality of circumferentially disposed axially spaced ring elements whereby said elements define a screen having adjacent openings, a motor mounted upon said housing continuously rotatably driving said drum during use, an ejector shaft within said drum rotatable about an axis substantially parallel

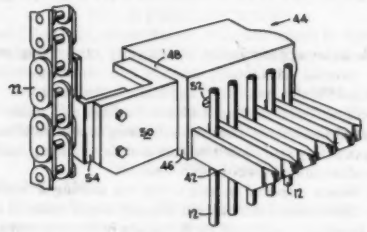
to and offset from said drum axis, a plurality of radial fingers mounted upon said ejector shaft extendable through said screen openings, and ejector shaft drive means rotating said ejector shaft in synchronization with the rotation of said screen drum to sequentially extend said fingers through said screen openings to clean debris therefrom, said ejector shaft drive means comprising a ring gear concentrically mounted upon said screen drum, a pinion gear concentrically mounted upon said ejector shaft, said ring and pinion gears meshing whereby rotation of said screen drum rotates said ejector shaft.

4,521,306

MECHANICALLY RAKED BAR SCREEN WITH CONVEYOR SYSTEM HAVING ELASTOMERIC RAKES

John T. Day, Winfield, Md., assignor to Rubber Millers, Inc., Baltimore, Md.

Filed Dec. 12, 1983, Ser. No. 560,395
Int. Cl.³ C02C *1/22*
U.S. Cl. 210—159 **7 Claims**



1. A debris removal system for removing debris from a fluid flow channel comprising a bar screen positioned in a fluid flow channel, conveyor means having attached thereto at least one elastomeric rake comprising teeth extending transverse to said conveyor means, said conveyor means being positioned whereby said teeth of said rake mesh with said bar screen for removal of debris from said bar screen, the elastomeric material of said elastomeric rake having a hardness measured on the durometer scale of 80 Shore A through 85 Shore D, and an elongation of at least 75% before failure; said rake further including a backing member for attachment of said rake to said conveyor, said backing member including a vertically extending leg and a horizontally extending leg, said horizontally extending leg terminating in a substantially U-shaped configuration; the legs of said U being constructed and arranged for mating with a member on said conveyor; shield means positioned at the top of said conveyor for preventing debris collected on said teeth from falling into said channel, said U-shaped member constructed and arranged to interrelate with said shield to keep said shield free of debris.

4,521,307

CONSERVATION OF MOMENTUM IN A BARRIER OXIDATION DITCH

John H. Reid, 7 Stansbury Ct., Fredericksburg, Va. 22401

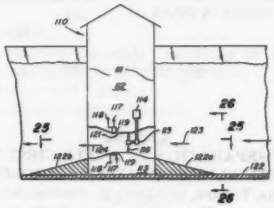
Division of Ser. No. 282,592, Jul. 13, 1981, which is a division of Ser. No. 28,383, Apr. 9, 1979, Pat. No. 4,278,537, which is a continuation-in-part of Ser. No. 848,705, Nov. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 649,995, Jan. 19, 1976, abandoned. This application Sep. 30, 1982, Ser. No. 429,266
Int. Cl.³ C02F *3/20*
U.S. Cl. 210—194 **9 Claims**

1. A barriered pump/aerator for continuously moving and aerating mixed liquor having translational-flow momentum within the endless channel of a barrier oxidation ditch, said barriered pump/aerator comprising:

(a) barrier means for dividing said mixed liquor into an intake body within an intake channel and a discharge body within a discharge channel, said barrier means comprising a pair of spaced-apart vertical walls disposed athwart said endless channel, and sealably attached to the sides of said endless channel;

(b) a discharge passage connecting said intake channel to said discharge channel;

(c) means for conserving a portion of said translational-flow momentum of said continuously moving mixed liquor by



permitting induced flow of said mixed liquor to move from said intake channel into said discharge channel without substantial hinderance, said momentum conservation means comprising a discharge slot coinciding with said discharge passage and extending from said intake channel to said discharge channel; and

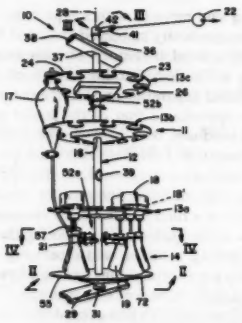
(d) a plurality of jet aerators which are disposed within said discharge slot and passage and which discharge in the direction of said induced flow.

4,521,308

ROTARY SUPPORT FOR VACUUM FILTRATION APPARATUS

George H. Brimhall, Jr., Berkeley, and Leonard J. Vigus, Walnut Creek, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 13, 1982, Ser. No. 407,708
Int. Cl.³ B01D *33/00*
U.S. Cl. 210—330 **13 Claims**



1. In vacuum filtration apparatus having a stand for supporting a plurality of filtration units which include filtrate receiver flasks and having a source of low pressure and means for communicating said filtrate receiver flasks with said low pressure source, the improvement comprising:

means for enabling rotational movement of said stand including the filtration units carried thereon about a predetermined axis, and

means for maintaining said filtrate receiver flasks in communication with said low pressure source during said rotational movement of said stand,

wherein said stand includes a rotatable tubular shaft having

an internal passage and at least one shelf mounted thereon, bearing means for supporting said shaft for rotation about said axis, rotating seal means for communicating said low pressure source with said internal passage of said shaft, and means for selectively and individually connecting said filtrate receiver flasks with said internal passage of said shaft.

4,521,309

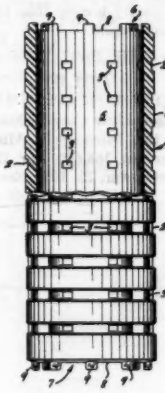
FILTER CARTRIDGE WITH CASTELLATED SUPPORT AND PROCESS OF MAKING THE SAME

David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation of Ser. No. 448,534, Dec. 10, 1982, abandoned, which is a continuation of Ser. No. 335,316, Dec. 29, 1981, abandoned, which is a continuation of Ser. No. 167,979, Jul. 14, 1980, abandoned. This application Mar. 16, 1984, Ser. No. 590,115

Int. Cl.³ B01D *27/06*

U.S. Cl. 210—493.2 **25 Claims**



1. A filter cartridge comprising, in combination:

(1) a filter sheet material formed in a tube open at at least one end;

(2) a support having a substantially closed tubular configuration disposed in supporting relation to and substantially coextensive with the tube and supporting the filter sheet material of the tube;

(3) the support having one end at the open end of the tube formed in a castellated configuration, the castellations having uniformly spaced raised portions and recessed portions in a number within the range from four to thirty-six over the 360° of support circumference, and in which the recessed portions have reentrant sides at an angle of less than 90° but not less than 30° to the base of the recessed portion; and

(4) at least one end cap attached to and extending across the open end of the tube of filter sheet material, and having embedded therein at least the castellated end of the support, with end cap material extending into and substantially filling the reentrant recessed portions, thereby fixedly attaching the end cap to the support in a leak-tight seal.

4,521,310

APPARATUS AND METHOD FOR THE TREATMENT OF ORGANIC WASTES

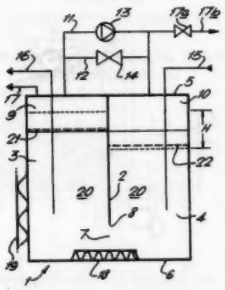
Thomas J. Casey, 22 Ardagh Ave., Blackrock, County Dublin, Ireland

Filed Aug. 30, 1983, Ser. No. 527,745

Claims priority, application Ireland, Aug. 31, 1982, 2115/82

Int. Cl.³ C02F *3/28*

U.S. Cl. 210—603 **12 Claims**



1. Apparatus for the anaerobic conversion of organic waste such as organic waste waters, sewage sludge, slurries and animal manures to biogas using a microbial biomass, said apparatus comprising: a single vessel closed reactor for receiving said organic waste, said reactor comprising a first chamber and a second chamber in liquid communication with each other adjacent their lower ends; a generally vertical partition separating said first chamber and said second chamber, said generally vertical partition being in gas tight communication with the top of the vessel and having an aperture adjacent the bottom thereof; a gas blower for conveying biogas which accumulates in said second chamber to said first chamber with a corresponding displacement of liquid material from said first chamber to said second chamber; and means for rapidly equalizing gas pressure in said chambers with a concomitant rapid reverse displacement of said liquid material from said second chamber to said first chamber whereby a liquid jet is created by said aperture during said rapid reverse displacement of said liquid material thereby sweeping solids in the bottom of said closed reactor into said first chamber at predetermined intervals, resulting in an oscillating flow of liquid material in said reactor and in intimate mixing of said organic waste and said biomass, and means for releasing biogas from either of said chambers.

4,521,311

ACTIVATED SLUDGE SYSTEM WITH INTEGRATED REGENERATOR

Uwe Fuchs, Munich, and Alfred Wildmoser, Haar, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 29, 1983, Ser. No. 518,712

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228365

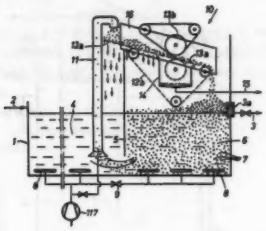
Int. Cl.³ C02F *3/06, 3/08*

U.S. Cl. 210—616 **18 Claims**

1. In a process for the biological purification of wastewater, comprising treating wastewater in a treatment zone in a reactor in the presence of activated sludge and separating the resultant mixture of treated wastewater and activated sludge into purified water and activated sludge, the improvement comprising:

passing said mixture after the treatment zone through a filter zone, arranged within the same reactor as that of the treatment zone, and containing a bed of support particles in an amount equal to about 40 to 80% of the volume of the filter zone, said particles being flexible, open cell,

porous organic polymers, to deposit resultant biomass onto the support particles, with said passing through said filter zone being conducted in a manner such that the degree of turbulence generated is insufficient to disrupt the bed of support particles in the filter zone, said filter zone being aerated during filtering with insufficient turbulence to disrupt the filter bed, and the passing of the mixture comprising flowing the mixture of wastewater and activated sludge upwardly in the filter zone;



transporting the support particles from the bottom area of the filter zone into an area above the filter bed for regeneration, regenerating the resultant loaded support particles and withdrawing biomass separated from the support particles during the regeneration;

withdrawing from said filter zone in a stream resultant purified wastewater; and

passing resultant regenerated support particles free of the biomass downwardly to the filter zone.

4,521,312

APPARATUS AND METHOD FOR SEPARATING A MIXTURE OF THREE LIQUIDS

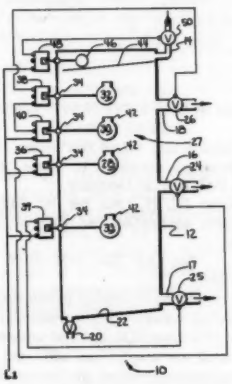
Edward M. Anderson, 2620 E. Medicine Lake Blvd., Minneapolis, Minn. 55441

Continuation-in-part of Ser. No. 374,344, May 3, 1982, Pat. No. 4,436,630. This application Feb. 14, 1983, Ser. No. 466,148

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.³ C02F *1/40*; B01D *21/24, 12/00*

U.S. Cl. 210—744 **13 Claims**



1. Apparatus for physically separating a mixture of three liquids, a first of the liquids being least dense, a second being a medial density liquid and a third being a most dense liquid, said apparatus comprising

(a) an upright liquid container;

(b) means defining a liquid inlet into the container for introduction of the mixture into the container;

(c) means defining a lower outlet for passing the medial density liquid from the container;

(d) a lower float in the container and at an elevational level above the level of the lower outlet;

(e) means in said lower outlet and operatively connected to said lower float for controlling flow through said outlet;

(f) means defining an upper outlet from the container, said upper outlet being at an elevational level above the elevational level of the lower float;

(g) a second float in the container and at an elevational level between the lower float and the upper outlet; and lower and second floats being of similar specific gravities which are more dense than the first liquid but less dense than the second liquid;

(h) means in said upper outlet which are operatively connected to said second float for controlling flow through said upper outlet, said second float and upper outlet flow control means being connected in parallel with said lower float and lower outlet flow control means;

(i) means defining a bottom outlet adjacent a bottom of the container, said bottom outlet having a valve for controlling flow therethrough; and

(j) a bottom float at a level inbetween the lower outlet and the bottom outlet, said bottom float being operatively connected to open only the bottom outlet valve and having a specific gravity greater than the second liquid and less than the third liquid.

4,521,313

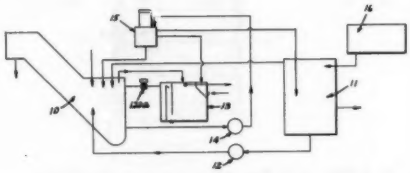
FLUID PURIFICATION SYSTEM

Girma Wolde-Michael, Little Canada, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Continuation of Ser. No. 368,650, Apr. 15, 1982, abandoned. This application Apr. 25, 1984, Ser. No. 603,776

Int. Cl.³ C02F *1/40*

U.S. Cl. 210—776 **3 Claims**



1. A process for separating apart from each other a heavier fluid, a lighter fluid, and particulate matter contained in a contaminated mixture, said process comprising the steps of:

(a) partially purifying the contaminated mixture by separating relatively heavy particulate matter from the mixture through gravitational settling in a first container and idling the process a pre-determined length of time allowing separable lighter fluid to separate from the mixture and form a layer at the surface of the mixture in the first container;

(b) transferring from a second container, a volume of substantially uncontaminated heavier fluid into the first container in a manner leaving the layer of separated lighter fluid at the mixture surface undisturbed and in sufficient quantity to raise the fluid surface in the first container to a preselected level;

(c) after the pre-selected level is reached, skimming the mixture surface by overflowing a portion of the mixture within the first container into a third container;

(d) concentrating the skimmed fluid in the third container;

(e) subsequent to step (c), transferring a portion of the par-

tially purified contaminated mixture in the first container to a centrifuge;

(f) separating in a single pass through the centrifuge the lighter fluid, the heavier fluid and the suspended particulate matter apart from each other within the centrifuge;

(g) transferring from the centrifuge the lighter liquid to the third container, and the heavier fluid to the second container;

(h) replenishing the heavier fluid contained in the second container by introducing fresh heavier fluid into the second container in sufficient amounts to achieve a preselected level of fluid within the second container;

(i) after step (h), skimming the surface of the replenished heavier fluid in the second container by overflowing a portion of the fluid into the first container; and

(j) after a pre-determined interval of time has elapsed following step (i), refreshing the fluid within the second container by circulating fluid from the first container through the centrifuge, and transferring recovered fluid from the centrifuge to the second container.

4,521,314
METHOD AND DEVICE FOR FILTERING YEAST AND OTHER PLANT CELL MATERIAL ON ROTARY VACUUM FILTER

Per O. Lundin, Sewell's Farm, Barcombe, Lewes, England; Sven Eriksson, Mariekällgatan 14, 151 32 Södertälje, and Ingvar Lundin, Sommarvägen 5, 191 70 Sollentuna, both of Sweden

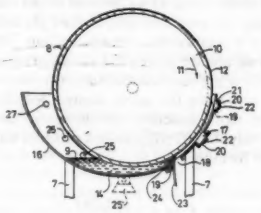
PCT No. PCT/SE81/00222, § 371 Date Mar. 16, 1982, § 102(e) Date Mar. 16, 1982, PCT Pub. No. WO82/00418, PCT Pub. Date Feb. 18, 1982

PCT Filed Jul. 22, 1981, Ser. No. 361,907

Claims priority, application Sweden, Jul. 25, 1980, 8005381

Int. Cl.³ B01D *37/02*

U.S. Cl. 210—777 **8 Claims**



1. A method for filtering a suspension, for example of yeast or other plant cell material, on a rotary vacuum filter (10), beneath which a trough (4) containing the suspension (14) is located, characterized in that, in this combination, a take-off knife (1,19) for descaling the filter cake (8) resulting from the filtering together with a thin layer of a precoat layer is secured on the trough (4); maintaining the level (9) of the suspension (14) in the trough (4) constant a small distance below the take-off knife whereby only a small peripheral portion of the drum is not used for dipping or drying, and moving at least that portion of the trough (4) which carries the take-off knife (1, 19) by means of a feeding device (7) toward the centre of the drum (12) of the vacuum filter (10) during filtration and while the drum (12) is rotating, to thereby provide a successive thin layer descaling of the precoat and obtain a constant dipping angle during filtration.

5. A device for filtering a suspension, for example of yeast or other plant cell material, on a rotary vacuum filter (10) comprising a drum (12) and beneath the same a trough (4) for the suspension and a take-off knife (1, 19) for descaling the filter cake resulting from the filtering together with a thin layer of a precoat layer, characterized in that the take-off knife (1,19) is removably secured to the trough (4), a feeding device supports the trough (4) and is operable to move at least that portion of the trough (4) which carries the take-off knife (1, 19) in the direction toward the centre of the drum (12) during rotation of the drum; and that means (5; 25–27) are provided in said trough for maintaining the suspension level, in the trough, constant during movement of the trough and only a small distance below the take-off knife whereby only a small peripheral portion of the drum is not used for dipping and drying.

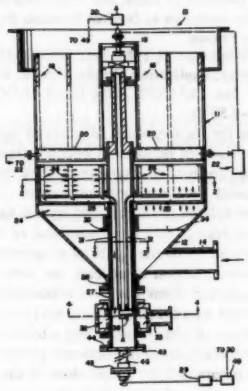
4,521,315
PULP THICKENING UTILIZING STATIONARY SCREENS

Oliver A. Laakso, Haralyn (W.), #2 Middle Rd., Smiths Parish, Bermuda

Filed Jan. 24, 1984, Ser. No. 573,412

Int. Cl.³ B01D *33/06*

U.S. Cl. 210—784 **18 Claims**



1. Apparatus for treating a suspension comprising: an upright cylindrical vessel having a vertical axis; a plurality of annular stationary screens disposed within said vessel and spaced from each other and from said axis; a plurality of radially extending extraction arms physically and hydraulically connected to said stationary annular screens, said extraction arms partitioning said vessel into a plurality of radial segments of substantially the same cross-sectional area, and said screens partitioning each radial segment into a plurality of vertically extending channels; a suspension inlet means mounted below said extraction arms and screens; and

suspension thickening means mounted between said suspension inlet means and said extraction arms and stationary screens, and comprising a plurality of rotatable hollow arms partitioning said vessel into a plurality of radial segments of substantially the same cross-sectional area, and a plurality of annular rotatable screens physically and hydraulically connected to said hollow arms for rotation therewith.

4,521,316
OIL WELL COMPLETION FLUID

Charles F. Sikorski, Plainsboro, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Mar. 11, 1983, Ser. No. 474,405

Int. Cl.³ E21B *43/00, 43/26*

U.S. Cl. 252—8.55 R **6 Claims**

1. A high density, corrosion-resistant, solids-free, well-treating fluid consisting essentially of an aqueous solution of at least about 50% by weight tetrapotassium pyrophosphate and a salt selected from the group consisting of monopotassium orthophosphate, dipotassium orthophosphate and tripotassium orthophosphate, said salt being present in amounts sufficient to yield a predetermined pH in said fluid of from about 8.5 to

about 12 and a predetermined specific gravity of at least about 1.65, said fluid having high resistance to recrystallization of the solutes dissolved therein.

4,521,317

PROCESS FOR MANUFACTURING A MICROLATEX IN A CONTINUOUS OIL PHASE BY POLYMERIZATION OF A WATER-SOLUBLE MONOMER IN A WATER-IN-OIL MICROEMULSION, RESULTANT MICROLATICES, AND THEIR USE FOR ENHANCED OIL RECOVERY

Francoise Candau; Yee-Sing Leong, both of Strasbourg; Norbert Kohler, St. Germain en Laye, and Francois Dawans, Bougival, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 8, 1983, Ser. No. 483,318

Claims priority, application France, Apr. 9, 1982, 82 06380

Int. Cl.³ C09K *3/00*; E21B *43/20*

U.S. Cl. 252—8.55 D **16 Claims**

1. A process for the treatment of an oil or gas well, wherein an aqueous solution of polymer is injected from the well into the surrounding formation, characterized by the injection of a solution obtained by dispersion into water of a stable and transparent microlatex itself obtained by the following steps:

(a) a stable and transparent microemulsion of the water-in-oil type is prepared by admixing (i) an aqueous phase comprising an aqueous solution of at least one water-soluble vinyl monomer selected from the group consisting of (3-sulfopropyl)-2-vinyl pyridinium betaine, acrylamide and acrylic acid with (ii) an oil phase comprising a hydrocarbon oil with at least one surfactant, in the optional presence of a co-surfactant, the nature and the proportions of the above components being so selected as to satisfy the following two conditions:

(α) the surfactant content of the oil phase is at least 2% by weight, the microemulsion comprises 1–50% by weight of the aqueous phase and 99–50% by weight of the oil phase with respect to the total weight of said aqueous phase and said oil phase and the aqueous phase comprises 5–55% by weight of the water-soluble vinyl monomer and 95–45% by weight of water, and

(β) the mixture of the two phases constitutes a stable and transparent microemulsion,

(b) the microemulsion obtained in step (a) is subjected to polymerization conditions, to form a stable and transparent microlatex of polymer or copolymer with a molecular weight of at least 500,000, and

(c) the resultant stable and transparent microlatex is recovered.

4,521,318

LUBRICANT COMPOSITIONS CONTAINING BOTH HYDROCARBYL SUBSTITUTED MONO AND BISSUCCINIMIDE HAVING POLYAMINE CHAIN LINKED HYDROXACYL RADICALS, AND NEOPENTYL DERIVATIVE

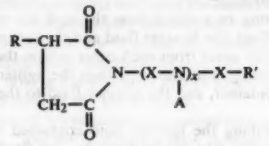
Thomas J. Karol, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,543

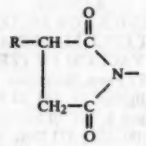
Int. Cl.³ C10M *1/48*, *3/42*

U.S. Cl. 252—46.7 **13 Claims**

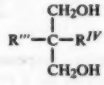
1. A lubricant composition comprising a major amount of a lubrication oil from about 0.06 to 0.07 weight percent based on nitrogen of a hydrocarbyl-substituted mono- and bis-succinimide having polyamine chain linked hydroxyacyl radicals represented by the formula:



in which R is a hydrocarbyl radical having from about 8 to 400 carbon atoms, X is a divalent alkylene or secondary hydroxy substituted alkylene radical having from 2 to 3 carbon atoms, A is hydrogen or a hydroxyacyl radical selected from the group consisting of glycolyl, lactyl, 2-hydroxy-methyl propionyl and 2,2'-bis-hydroxymethyl propionyl radicals and in which at least 30 percent of said radicals represented by A are said hydroxyacyl radicals, x is a number from 1 to 6, and R' is a radical selected from the group consisting of —NH_2, —NHA, or a hydrocarbyl substituted succinyl radical having the formula:



in which R has the values noted above; and from about 1 to 3 weight percent of a polyol derivative prepared by the method comprising (a) contacting an aliphatic polyolefin of an average molecular weight between about 250 and 50,000 with P_2S_5 in the presence of between about 0.1 and 5 wt. percent sulfur at a temperature of between about 100° and 320° C., P_2S_5 comprising between about 5 and 40 wt. percent of the reaction mixture, (b) contacting the resultant polyolefin-P_2S_5 reaction product with steam at a temperature between about 100° and 260° C. utilizing at least about a mole ratio excess of steam in respect to said polyolefin-P_2S_5 reaction product, (c) removing inorganic phosphorus acid from the steam treated polyolefin-P_2S_5 reaction product, (d) contacting the inorganic acid free, steam hydrolyzed polyolefin-P_2S_5 reaction product with a neopentyl polyol of the formula:



where R''' and R^{IV} are selected from the group consisting of alkylol and alkyl of from 1 to 20 carbon atoms at a temperature between about 180° and 220° C. in a mole ratio of said inorganic phosphorus acid free, steam hydrolyzed P_2S_5-polyolefin reaction product to said polyol of between about 1:0.33 and 1:2 to form said polyol derivative.

4,521,319

DISPERSANT LUBRICATING OIL ADDITIVES

Timothy R. Erdman, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 243,274, Mar. 13, 1981, Pat. No. 4,410,437, which is a division of Ser. No. 966,179, Dec. 4, 1978, Pat. No. 4,275,006. This application Aug. 2, 1983, Ser. No. 519,784

Int. Cl.³ C10M *1/38*

U.S. Cl. 252—47.5 **3 Claims**

1. A process for preparing a lubricating oil additive which comprises reacting at a temperature of from 20° C. to 200° C. a compound, selected from the group consisting of an oil soluble Mannich base condensation product and an oil soluble borated Mannich base condensation product wherein said oil

soluble Mannich base condensation product and oil soluble borated Mannich base condensation product contain at least one primary or secondary amino group, with SO_2 with from 0.2 to 2 mols of SO_2 for every 2 mols of basic nitrogen present in said oil soluble Mannich base condensation product and oil soluble borated Mannich base condensation product.

2. A lubricating oil additive prepared according to the process of claim 1.

3. A lubricating oil composition comprising an oil of lubricating viscosity and from 0.1 to 10 percent by weight of the additive defined in claim 2.

4,521,320

THIOCARBAMATE STABILIZERS

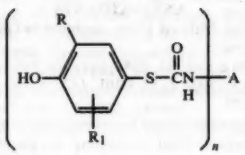
John D. Spivack, and Stephen D. Pastor, both of Spring Valley, N.Y., assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,295

Int. Cl.³ C10M *1/38;* **C07C** *155/02;* **C09K** *15/26*

U.S. Cl. 252—47.5 **16 Claims**

1. A compound of the formula



wherein

R and R_1 are independently hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 18 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 12 carbon atoms;

n is 1–3, and

when n=1, A is alkyl of 1 to 30 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or lower alkyl substituted benzyl;

when n=2, A is alkylene of from 1 to 10 carbon atoms, cycloalkylene of 5 to 6 carbon atoms, lower alkyl-substituted cycloalkylene of 5 to 6 carbon atoms, lower alkylene-substituted cycloalkylene of 5 to 6 carbon atoms, arylene biphenylene, hydroxy-substituted arylene or polyoxyalkylene with from 2 to 4 carbon atoms in the repeating unit; and

when n=3, A is arylene, biphenylene, hydroxy-substituted arylene or alkanetriyl of from 3 to 6 carbon atoms.

16. A method for stabilizing an organic material selected from the group consisting of polyolefins, polystyrene, rubbers, polyesters and lubricating oils against oxidative, thermal and actinic degradation which comprises incorporating into said organic material an effective stabilizing amount of a compound of claim 1.

4,521,321

CONVEYOR TRACK LUBRICANT COMPOSITION EMPLOYING PHOSPHATE ESTERS AND METHOD OF USING SAME

Patricia A. Anderson, Acton; Roger G. Hagens, Hamilton, and Dianne M. Roden, Waterdown, all of Canada, assignors to Diversey Wyandotte Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 373,985, May 3, 1982, abandoned. This application Sep. 12, 1983, Ser. No. 531,042

Int. Cl.³ C10M *1/46*

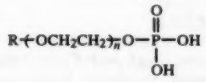
U.S. Cl. 252—49.3 **15 Claims**

1. In a method for lubricating a continuously-moving conveyor system for transporting packages from a first station to a second station and wherein said packages are temporarily detained at said first station while said conveyor moves beneath said packages, and said conveyor system is wetted with an aqueous lubricant composition;

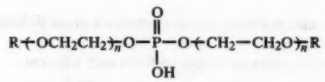
the improvement wherein said aqueous lubricant composition comprises:

A. a phosphate ester component consisting essentially of:

(i) 51 to 100 percent by weight of a mono alkyl phosphate ester of the formula



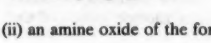
(ii) 0 to 49 percent by weight of a dialkyl phosphate ester of the formula



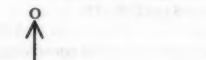
wherein the concentration of said phosphate ester component in said lubricant composition is in the range 1.0×10^{-3} to 3.0×10^{-3} molar;

B. a synergist component selected from the group consisting of:

(i) an alcohol of the formula



(ii) an amine oxide of the formula



(iii) urea, said synergist present in an amount between 10 and 150 percent of the weight of said phosphate ester component;

wherein m and n can have a value of zero through three, R and R′ are selected from the group consisting of (i) linear saturated primary alkyl groups, C_{14} through C_{18}, (ii) linear partially unsaturated primary alkyl groups C_{16} through C_{20}, and (iii) a mixture of linear saturated primary alkyl groups C_{12} through C_{20}, wherein the average length of the alkyl substituant is C_{13} through C_{18}, and R″ is a mixture of saturated and unsaturated alkyl groups C_8 through C_{18} having an average chain length C_{12} through C_{18}; and

said lubricant composition being at least partially neutralized with a base whereby its pH is in the range 5.0 through 10.0.

4,521,322

PROCESS FOR MANUFACTURING A PIEZO- OR PYROELECTRIC POLYMER MATERIAL COMPRISING A CROSS-LINKING STEP

Dominique Broussoux, Marcoussis; Hugues Facoetti, Fontenay-Sous-Bois; Francois Micheron, Gif-sur-Yvette, and Lucien Monnerie, Paris, all of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 20, 1983, Ser. No. 543,963

Claims priority, application France, Oct. 22, 1982, 82 17739

Int. Cl.³ B01J *1/10;* **C08F** *8/00*

U.S. Cl. 252—62.9 **11 Claims**

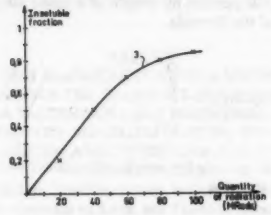
1. A process for manufacturing at least one piezoelectric or pyroelectric element formed from a polymer material capable of acquring piezoelectric or pyroelectric properties comprising

pressing polymer pellets to form polymer sheets

dipping the polymer sheets in water,

stretching the dipped sheets,

electrically polarizing said polymer sheets by applying between the two faces of said sheets an electric orientation field,



irradiating said polymer sheets to obtain a cross-linking rate close to 0.5, and

reheating said polymer sheets to form said element.

4,521,323

POLYCRYSTALLINE FERRITE AND A MAGNETIC HEAD USING THE SAME

Ken Hirota, Toyonaka; Yoshiaki Fujimoto, Miyazaki; Kouichi Watanabe, Miyazaki, and Minoru Sugimura, Miyazaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 27, 1984, Ser. No. 625,353

Int. Cl.³ C04B *35/30, 35/38*

U.S. Cl. 252—62.59 **4 Claims**

1. A polycrystalline Mn-Zn or Ni-Zn ferrite containing from 0.01 to 0.5% by weight of Na and from 0.005 to 0.5% by weight of Zr, and exhibiting a higher critical stress intensity factor, K_{IC}, than said ferrite absent either Na or Zr.

4,521,324

FLUID FOR TRACTION DRIVE

Toshiyuki Tsubouchi, Sodegaura, and Hitoshi Hata, Ichihara, both of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Oct. 7, 1983, Ser. No. 539,980

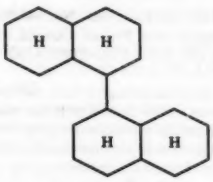
Claims priority, application Japan, Oct. 14, 1982, 57-179078

Int. Cl.³ C10M *1/02;* **C07C** *13/605*

U.S. Cl. 252—73 **10 Claims**

1. A process for improving the coefficient of traction between at least two relatively rotatable elements in a torque transmitting relationship and for maintaining said coefficient of traction substantially constant over a broad range of operating temperatures which comprises introducing between the tractive surfaces of said elements a traction drive fluid comprising as the active component at least one compound selected by the general formulae (I), (II) and (III):

(I)



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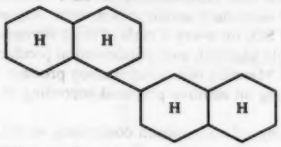
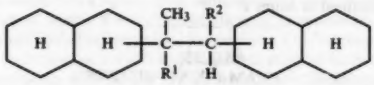
(II)



(III)



wherein R_1 and R_2 are each a hydrogen or methyl group, said traction drive fluid being essentially free of 2,2'-bisdecalin.

4,521,325

SELECTED N,1-DISUBSTITUTED HYDRAZINECARBOXAMIDES AND THEIR USE AS ANTIOXIDANTS

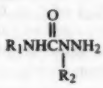
Bonnie B. Sandel, Milford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Dec. 12, 1983, Ser. No. 560,721

Int. Cl.³ C10M *1/32;* **C10L** *1/22;* **C07C** *133/02*

U.S. Cl. 252—77 **21 Claims**

13. An oxidation-inhibited functional fluid composition comprising a functional fluid containing an effective oxidation-inhibiting amount of an N,1-disubstituted hydrazinecarboxamide having the formula



wherein R_1 is selected from the group consisting of an alkyl containing from 1 to about 20 carbon atoms, an aromatic containing from 6 to about 12 carbon atoms, and cycloalkyl containing from about 5 to about 10 carbon atoms, and wherein R_2 is selected from the group consisting of an alkyl containing from 1 to about 20 carbon atoms and a hydroxyalkyl containing from 2 to about 20 carbon atoms.

4,521,326

THICKENING AGENT BASED ON POLYETHER DERIVATIVES

Karl Seibert, Dueren-Niederau; Klaus Neumann, Kreuzau-Obermaubach; Ernst Spiess, Erftstadt-Gymnich, all of Fed. Rep. of Germany, and Hendrik G. Bruil, Ede, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

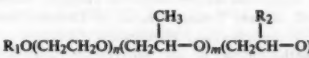
Filed Feb. 28, 1983, Ser. No. 470,803

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207613

Int. Cl.³ C11D *1/722;* **C07C** *41/10, 43/10*

U.S. Cl. 252—174.21 **16 Claims**

1. A thickening agent comprising polyether derivatives, said polyether derivatives being of the general formula



wherein R_1 is a substituted or unsubstituted hydrocarbon radical or an alkylphenol radical having 10 or more carbon atoms, n is 10 to 100, m is 0 to 25, and p is 1 to 3, and wherein R_2 is an alkyl radical having 8 to 30 carbon atoms, said polyether derivatives being prepared by the gradual addition of a long-chain 1,2-epoxy having a chain length of 10 to 32 carbon atoms at

temperatures from 100° to 200° C., to either (1) a polyethylene glycol monoether having an average molecular weight of 800 to 5000, the monoether group thereof being a substituted or unsubstituted hydrocarbon radical having at least 10 carbon atoms; or to (2) a polyethylene glycol-polypropylene glycol monoether with an average molecular weight of 850 to 6300, and having repeating ethylene oxide and propylene oxide units each forming a polyethylene glycol and polypropylene glycol block, respectively, the polypropylene glycol block having an average molecular weight of no more than 1300, the monoether group forming the end of the polyethylene glycol block and being a substituted or unsubstituted hydrocarbon radical having at least 10 carbon atoms, and wherein the agent is prepared using 0.1 to 1% by weight of an alkali hydroxide, referring to the total quantity of said long-chain epoxy and said monoether.

4,521,327

NEMATIC LIQUID CRYSTALS AND METHOD FOR PRODUCTION THEREOF

Dietrich Demus, Halle; Hans-Matthias Vorbrodt, Quedlinburg; Anton Hauser, Wettin; Jörg Vogel, Biesenthal, and Horst Zaschke, Halle, all of German Democratic Rep., assignors to VEB Werk für Fernsehelektronik im VEB Kombinat Mikroelektronik, Berlin, German Democratic Rep.

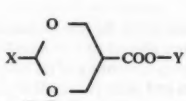
Filed Feb. 3, 1983, Ser. No. 463,377

Claims priority, application German Democratic Rep., Feb. 17, 1982, 237467; Feb. 17, 1982, 237468

Int. Cl.³ C09K *3/34;* **C02F** *1/13;* **C07D** *319/06;* **C09K** *11/06*

U.S. Cl. 252—299.61 **38 Claims**

1. A 2-substituted-1,3-dioxane-5-carboxylic acid ester having the general formula



in which X = R^1 and Y = R^2 or R^5

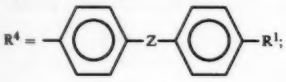
or X = R^3 and Y = R^5

or X = R^3 and Y = R^4

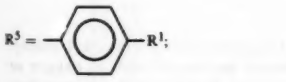
wherein $R^1 = C_nH_{2n+1}$; $C_nH_{2n+1}O$; CN; NO_2;

$R^2 = C_nH_{2n+1}$;

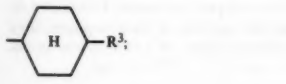
$R^3 = C_nH_{2n+1}$



R^4 = —Z— R^1;



R^5 = — R^1;



H — R^3;

Z = —COO—;

with n=1 to 10.

14. Trans-2-n-hexyl-1,3-dioxane-5-carboxylic acid-(4-(2,2'-dicyanoethenyl)-phenyl ester).

16. Trans-4-n-hexyl-1,3-dioxane-5-carboxylic acid-(4-cyanoethylphenyl ester).

20. Trans-2-(4-n-hexoxyphenyl)-1,3-dioxane-5-carboxylic acid-(4-(2,2'-dicyanoethenyl)-phenyl ester).

23. 2-n-hexyl-1,3-dioxane-5-carboxylic acid-(4-(4-n-heptoxyphenoxycarbonyl)-2-ethylphenyl ester).

4,521,328

METHOD OF MAKING CARBON MATERIAL

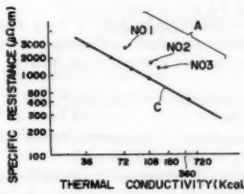
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Aug. 6, 1981, Ser. No. 290,778

Claims priority, application Japan, Aug. 11, 1980, 55-109150

Int. Cl.³ H01B *1/02*

U.S. Cl. 252—502 **8 Claims**



1. A method for the manufacture of an oxygen-impregnated carbon material, comprising the steps of:

(a) impregnating carbonaceous particles with oxygen in an amount of 10 to 1000 ppm by subjecting said particles to a stream of ozone for a predetermined time period; and

(b) sintering a mass of the oxygen-impregnated carbonaceous particles to form said material.

4,521,329

COPPER CONDUCTOR COMPOSITIONS

Vincent P. Siuta, Cherry Hill, N.J., and Joel Slutsky, Williamsville, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 20, 1983, Ser. No. 505,730

Int. Cl.³ H01B *1/02*

U.S. Cl. 252—512 **7 Claims**

1. A printable thick film conductor composition comprising an admixture of finely divided particles of:

(a) metallic copper having an oxide coating which contains at least 0.2% by weight oxygen as a copper oxide coating, the particles having a size range of 0.5–10 μm, average particle size of 1–5 μm and a surface-to-weight ratio of less than 1 m^2/g;

(b) copper oxide having a size range of 0.1–10 μm and average particle size of 0.5–5 μm, the weight ratio of copper oxide particles to oxide-coated copper metal particles being from 0 to 0.15;

(c) an inorganic binder having a softening point of 300°–700° C., a size range of 1–15 μm, the weight ratio of copper oxide in the binder to copper metal particles being from 0 to 0.5, all dispersed in

(d) an organic medium containing not more than 1.0% wt. resin, basis total composition, the total oxygen content of the copper oxides of (a), (b) and (c) being sufficient to provide 1–2% by weight oxygen, basis copper, and the weight ratio of oxygen added as copper oxide in (b) and (c) to copper oxide on the copper metal particles is from 0.2 to 0.5.

4,521,330
NON-AQUEOUS UREA-POLYETHER GEL COMPOSITIONS AND A METHOD FOR THEIR PREPARATION

Franciszek Olstowski, Freeport, and Richard D. Peffley, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 12, 1983, Ser. No. 531,555
Int. Cl.³ C10M *1/20, 1/32, 1/44, 1/50*
U.S. Cl. 252—51.5 R **7 Claims**

1. A method for either increasing the viscosity of or gelling a composition which comprises

(A) from about 10 to about 100%, by weight of at least one relatively high molecular weight polyoxyalkylene-containing material having a molecular weight greater than about 500 and containing at least about 10% by weight of either an internal block or external block of oxyethylene (—O—CH_2—CH_2—) groups; and

(B) from zero to about 90, weight percent of a member selected from the group consisting of

(1) liquid relatively high molecular weight polyoxyalkylene-containing materials containing less than about 10 wt. % oxyethylene groups or an internal or terminal block;

(2) liquid hydrocarbon compounds,

(3) liquid esters,

(4) liquid halogenated hydrocarbon compounds,

(5) liquid organo silicon compounds,

(6) liquid organo phosphorous compounds, and

(7) mixtures thereof;

which process comprises blending with the aforesaid composition a sufficient quantity of

(C) a solution of

(1) a relatively low equivalent weight material having a molecular weight less than about 500 and having from about 2 to about 8 hydroxyl groups per molecule containing

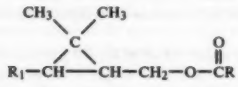
(2) a sufficient quantity of urea to cause either an increase in viscosity over that of either of components (A) or (B) or cause gellation of the resultant mixture of components (A), (B) and (C) in a relatively short period of time.

4,521,331
METHOD OF IMPARTING A PLEASANT ODOR

Jacques Martel, Bondy; Jean Buendia, Le Perreux-sur-Marne, and Francois Nezot, Thiais, all of France, assignors to Roussel Uclaf, Paris, France

Filed Nov. 2, 1982, Ser. No. 438,486
Claims priority, application France, Nov. 10, 1981, 81 21009
Int. Cl.³ C11B *9/00;* **C11D** *3/50;* **A61K** *7/16*
U.S. Cl. 252—522 R **7 Claims**

1. A perfume containing an odorantly effective amount of at least one compound of the formula



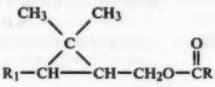
I

wherein R_1 is selected from the group consisting of alkyl of 1 to 8 carbon atoms and alkenyl of 2 to 8 carbon atoms and R is selected from the group consisting of (a) hydrogen, (b) alkyl of 1 to 12 carbon atoms and alkenyl and alkynyl of 2 to 12 carbon atoms optionally substituted with cyano, saturated or unsaturated cycloalkyl or bicycloalkyl of 3 to 12 carbon atoms also optionally substituted with at least one alkyl of 1 to 4 carbon atoms, —CN, —NO_2 or —COAlkyl of 1 to 6 carbon atoms, and optionally interrupted by an oxygen atom or containing a keto group, (c) cycloalkyl of 3 to 12 carbon atoms optionally having at least one double bond and at least one alkyl substituent of 1 to 4 carbon atoms, (d) aryl, arylalkyl, aralkenyl and aralkynyl of 6 to 20 carbon atoms optionally substituted on the aryl ring with at least one member of the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, —NO_2, —CF_3, —CN and —COAlk and

and Alk is alkyl of 1 to 12 carbon atoms and the alkyl, alkenyl or alkynyl being optionally interrupted with an oxygen or containing a ketone group and (e) heteroaryl, heteroaralkyl, heteroaralkenyl and heteroaralkynyl optionally substituted on the aryl ring with at least one member of the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, —NO_2, —CF_3, —CN and —COAlk and

and Alk is alkyl of 1 to 12 carbon atoms and the alkyl, alkenyl and alkynyl being optionally interrupted with an oxygen atom or having a keto group and customary perfumery ingredients.

2. A method of imparting a pleasant odor to a composition comprising adding to the composition a sufficient amount of at least one compound of the formula



I

wherein R_1 is selected from the group consisting of alkyl of 1 to 8 carbon atoms and alkenyl of 2 to 8 carbon atoms and R is selected from the group consisting of (a) hydrogen, (b) alkyl of 1 to 12 carbon atoms and alkenyl and alkynyl of 2 to 12 carbon atoms optionally substituted with cyano, saturated or unsaturated cycloalkyl or bicycloalkyl of 3 to 12 carbon atoms also optionally substituted with at least one alkyl of 1 to 4 carbon atoms, —CN, —NO_2 or —COAlkyl of 1 to 6 alkyl carbon atoms, and optionally interrupted by an oxygen atom or containing a keto group, (c) cycloalkyl of 3 to 12 carbon atoms optionally having at least one double bond and at least one alkyl substituent of 1 to 4 carbon atoms, (d) aryl, arylalkyl, aralkenyl and aralkynyl of 6 to 20 carbon atoms optionally substituted on the aryl ring with at least one member of the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms halogen, —NO_2, —CF_3, —CN and —COAlk and

and Alk is alkyl of 1 to 12 carbon atoms and the alkyl, alkenyl and alkynyl being optionally interrupted with an oxygen or containing a ketone group and (e) heteroaryl, heteroaralkyl, heteroaralkenyl and heteroaralkynyl optionally substituted on the aryl ring with at least one member of the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, —NO_2, —CF_3, —CN and —COAlk and

and Alk is alkyl of 1 to 12 carbon atoms and the alkyl, alkenyl and alkynyl being optionally interrupted with an oxygen atom or having a keto group, to impart a pleasant odor.

4,521,332

HIGHLY ALKALINE CLEANING DISPERSION

David J. Milora, Norristown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 246,481, Mar. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 153,489, May 27, 1980, abandoned. This application May 3, 1982, Ser. No. 373,924
Int. Cl.³ C11D 3/37, 7/06, 7/16, 7/26
U.S. Cl. 252—527 8 Claims

1. A liquid highly alkaline aqueous cleaning dispersion which resists separation into layers said dispersion containing at least about 40% solids by weight and comprising the following ingredients expressed as percent by weight:

Sodium hydroxide: 10 to 45%

Alkali metal or ammonium salt of polyacrylic acid having a molecular weight within the range of 500 to 12,000: 0.04% to gelling

Alkali metal phosphate builder: 2 to 15%

Nonionic surfactant: 0.3 to 5%

Chelator: 0.25 to 3%

Sodium or potassium carbonate as a bulking agent: 0.5 to 20%

Water: Balance

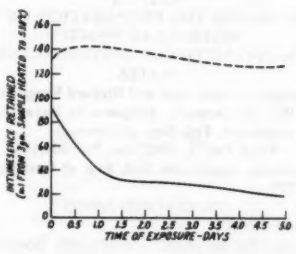
in which the chelator is one or more members selected from group consisting of sorbitol, gluconic acid, glucoheptonic acid, mannitol, ascorbic acid, sorbose, tannic acid, ethylenediamine tetraacetic acid, sodium chrom glucosate, diglycolic acid, aspartic acid, d-gluconolactone, l-rhamnose, nitrilotriacetic acid, and the sodium or potassium salts of the acids.

4,521,333

INTUMESCENT SILICATES HAVING IMPROVED STABILITY

Joseph Graham, Timothy J. Gennrich, and James A. Laird, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 505,982, Jun. 20, 1983,. This application May 3, 1984, Ser. No. 605,053
Int. Cl.³ C09K 3/28
U.S. Cl. 252—606 18 Claims



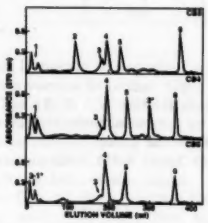
1. An intumescent composition comprising a mixture of alkali metal silicate, represented by the formula $M_2O:xSiO_2$ in which M is the alkali metal; at least one oxy boron compound selected from the group consisting of boric acid and borate salts of Group I and II elements; and water; in which the weight ratio x ranges from about 1.5 to about 4, the molar ratio of boron to M is between about 0.2 and about 0.9, and the water comprises about 5 to 15 weight percent of the total composition.

4,521,334

SYNTHETIC POLYPEPTIDE FRAGMENTS

Edwin H. Beachey, Memphis, Tenn., assignor to The University of Tennesse Research Corporation, Knoxville, Tenn.

Continuation-in-part of Ser. No. 402,355, Jul. 27, 1982, Pat. No. 4,454,121. This application Jun. 10, 1983, Ser. No. 503,273
Int. Cl.³ C07C 103/52; A61K 39/00, 37/00
U.S. Cl. 260—112.5 R 7 Claims



1. A polypeptide which elicits opsonic antibodies to *Streptococcus pyogenes* and which is not serologically cross-reactive with tissue antigens of the heart, which polypeptide comprises the amino acid sequence

Asn-Phe-Ser-Thr-Ala-Asp-Ser-Ala-Lys
Ile-Lys-Thr-Leu-Glu-Ala-Glu-Lys-Ala-Ala-Leu-A-Ala-B-C-Ala-D-Leu-E-F-Ala-Leu-Glu-G-H-I

wherein

A is Glu or Ala

B is Glu or Arg

C is Lys or Gln

D is Asp or Glu

E is Glu or Asp

F is Lys or Asp

G is Gly or Leu

H is Ala or Glu

I is Hse, Met, Gly-Ala-Hse, or Gly-Ala-Met,

with the proviso that the polypeptide is not any one of the four following sequences:

Ans-Phe-Ser-Thr-Ala-Asp-Ser-Ala-Lys-Ile-Lys-Thr-Leu-Glu-Ala-Glu-Lys-Ala-Ala-Leu-Ala-Ala-Arg-Lys-Ala-Asp-Leu-Glu-Lys-Ala-Leu-Glu-Gly-Ala-I, or

Asn-Phe-Ser-Thr-Ala-Asp-Ser-Ala-Lys-Ile-Lys-Thr-Leu-Glu-Ala-Glu-Lys-Ala-Ala-Leu-Glu-Ala-Arg-Gln-Ala-Glu-Leu-Glu-Lys-Ala-Leu-Glu-Gly-Ala-I,

wherein I is Met or Hse.

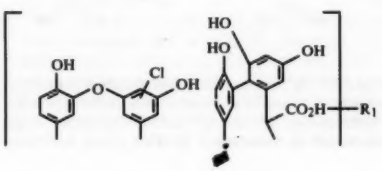
4,521,335

AGLYCONE AND PSEUDO-AGLYCONES OF THE AAD 216 ANTIBIOTICS

George W. Chan, Bala Cynwyd, and Robert D. Sitrin, Plymouth Meeting, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 513,514, Jul. 13, 1983,. This application May 17, 1984, Ser. No. 611,070
Int. Cl.³ C07C 103/52
U.S. Cl. 260—112.5 R 6 Claims

1. An antibiotic compound represented by the structural formula (I)



(I)

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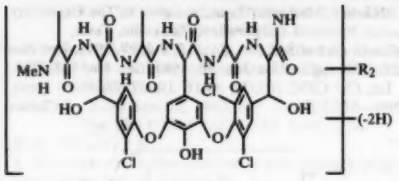


wherein R_1 is hydrogen or mannosyl and R_2 is hydrogen or a glycolipid radical of unknown structure with the proviso that at least one of R_1 and R_2 is hydrogen, prepared by the partial acidic hydrolysis of an antibiotic selected from the group consisting of AAD 216 complex, AAD 216A, AAD 216B and AAD 216C.

4,521,336

PROCESS FOR PREPARING LIGNOSULFONATES

Peter Dilling, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 16, 1984, Ser. No. 601,047

Int. Cl.³ C07G 1/00

U.S. Cl. 530—501 **10 Claims**

1. In a process for preparing sulfonated lignins which comprises reacting lignin material with an aldehyde and a sulfite, selected from the group consisting of water soluble sulfites and bisulfites, wherein the improvement comprises the steps of

(a) selectively isolating the lignin material from alkaline black liquor by reducing the black liquor pH such that all but a negligible amount of the lignins having a molecular weight of 5,000 or less remain in solution with the black liquor,

(b) acidifying the lignin material to a pH of from about 1.5 to about 5.0 by washing with sulfuric acid followed by adding water to the lignin material to form a slurry of about 25% solids,

(c) adding to the lignin slurry the sulfite and the aldehyde in a sulfite to aldehyde mole ratio of from about 1.1:0.1 to about 2.5:1.0, which addition produces an initial reaction pH of from about 8.0 to about 9.2, and

(d) the temperature of reaction is raised from ambient to from about 130° C. to about 175° C. for from about 0.5 to about 12 hours.

4,521,337

CHEMICAL PROCESS

Robert Southgate, Warnham, and Pamela Brown, Guildford, both of England, assignors to Beecham Group p.l.c., England

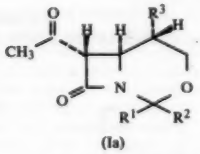
Filed Mar. 14, 1983, Ser. No. 475,247

Claims priority, application United Kingdom, Mar. 16, 1982, 8207619

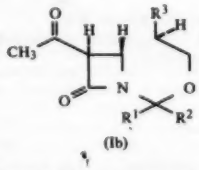
Int. Cl.³ C07D 498/04

U.S. Cl. 534—560 **8 Claims**

1. A process for the preparation of a compound of the formula (Ia) and/or (Ib):

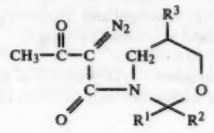


(Ia)



(Ib)

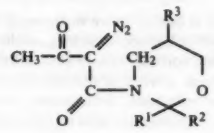
wherein R^1 and R^2 are independently hydrocarbon groups or are joined together so as to form a carbocyclic or heterocyclic ring, said hydrocarbon groups and said heterocyclic rings being unsubstituted or substituted by C_{1-6} alkyl, hydroxy, bromine, chlorine, fluorine, carboxylic acid or salt or ester thereof, azido, tetrazolyl, alkanoyl, alkanoyloxy, aroyloxy, aroyl, aralkanoyloxy, aroxy, amino, protected amino, nitro, C_{1-6} alkoxy, C_{1-6} alkyl, aryl, C_{1-6} alkylthio or arylthio, and R^3 is a hydrocarbon group unsubstituted or substituted by amino, mono, di- or trialkylamino, hydroxyl, alkoxyl, mercapto, alkylthio, arylthio, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, cyano or carboxy; which process comprises the ring-closing cyclization of a compound of the formula (II):



(II)

wherein R^1, R^2 and R^3 are as defined in relation to formulae (Ia) and (Ib).

6. A compound of formula II



(II)

wherein R^1 and R^2 are independently hydrocarbon groups or are joined together so as to form a carbocyclic or heterocyclic ring, said hydrocarbon groups and said heterocyclic rings being unsubstituted or substituted by C_{1-6} alkyl, hydroxy, bromine, chlorine, fluorine, carboxylic acid or salt or ester thereof, azido, tetrazolyl, alkanoyl, alkanoyloxy, aroyloxy, aroyl, aralkanoyloxy, aroxy, amino, protected amino, nitro, C_{1-6} alkoxy, C_{1-6} alkyl, aryl, C_{1-6} alkylthio or arylthio, and R^3 is a hydrocarbon group unsubstituted or substituted by amino, mono, di- or trialkylamino, hydroxyl, alkoxyl, mercapto, alkylthio, arylthic, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, cyano or carboxy.

4,521,338

PROCESS FOR THE PREPARATION OF LOW MOLECULAR WEIGHT 4,4'-DIPHENYLMETHANE-URETDIONE-DIISOCYANATES

Gerhard Grögler, Leverkusen, and Richard Kopp, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

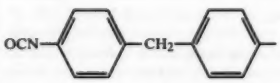
Filed Aug. 2, 1982, Ser. No. 404,106

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1981, 3131779

Int. Cl.³ C07D 229/00

U.S. Cl. 260—239 A **20 Claims**

1. A process for the production of a low molecular weight 4,4'-diphenylmethane-uretdione-diisocyanate corresponding to the formula:



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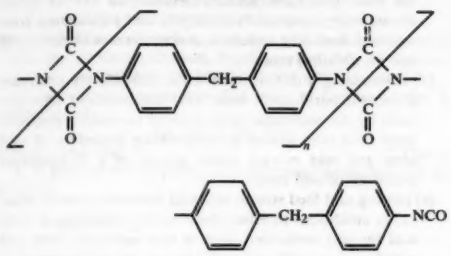


in which n represents a number from 0 to 1, comprising dimerizing a 4,4'-diphenylmethane-diisocyanate at a temperature less than 50° C. in the presence of a catalyst and in an isocyanate-inert solvent-mixture of non-polar and moderately polar solvents.

4,521,339

ANSATRIENOLS

Noboru Otake, Yokohama; Haruo Seto, Hachioji; Tetsuo Sasaki, Kounosu; Masanori Sugita, Sakado; Yohei Natori, Tokyo, and Noriyoshi Sueda, Kawagoe, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Japan

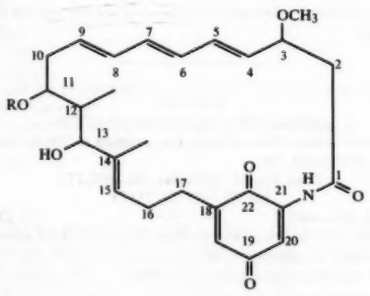
Filed Nov. 24, 1982, Ser. No. 444,474

Claims priority, application Japan, Nov. 27, 1981, 56-189237; Nov. 27, 1981, 56-189238; Dec. 18, 1981, 56-203558

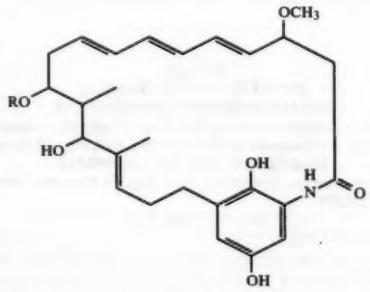
Int. Cl.³ C07D *225/06;* **C12P** *17/10*

U.S. Cl. 260—239.3 B **4 Claims**

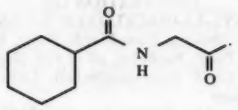
1. A compound of the formula



or



wherein R is hydrogen or a group



4,521,340

PHARMACEUTICALLY ACCEPTABLE SALTS OF THE ANTIBIOTIC C-19393 E_5

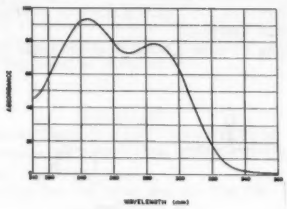
Setsuo Harada, Kawanishi; Susumu Shinagawa, Higashiosaka, and Kazuaki Kitano, Sakai, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 30, 1981, Ser. No. 316,903

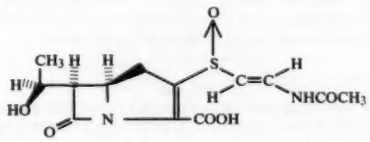
Claims priority, application Japan, Dec. 26, 1980, 55-185450

Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.2 T **1 Claim**



1. A pharmaceutically acceptable salt of antibiotic C-19393 E_5 of the formula



4,521,341

PROCESS FOR THE PREPARATION OF 1,4-DIAMINO-ANTHRAQUINONE-2-SULPHONIC ACID

Friedrich W. Kröck, Cologne, and Rütger Neoff, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 313,025, Oct. 19, 1981, abandoned. This application Mar. 16, 1984, Ser. No. 590,133

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042241

Int. Cl.³ C07C *143/665*

U.S. Cl. 260—371 **8 Claims**

1. Process for the preparation of 1,4-diamino-anthraquinone-2-sulphonic acid and its salts by reacting 1-amino-4-bromo-anthraquinone-2-sulphonic acid, or its salts, with aqueous ammonia solution at an elevated temperature in the presence of copper catalysts and, if appropriate, in the presence of acid-binding agents, characterised in that the reaction is carried out under a partial pressure of ammonia of at least 5 bar.

4,521,342
PREPARATION OF 2-ALKYL-4,4-DIACYLOXYBUT-2-ENALS

Rolf Fischer, Heidelberg; Hans-Martin Weitz, Bad Durkheim, and Joachim Paust, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

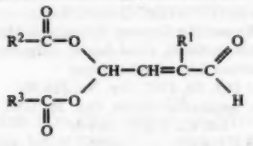
Filed Mar. 7, 1983, Ser. No. 473,096

Claims priority, application Fed. Rep. of Germany, Mai 24, 1982, 3210706

Int. Cl.[3] **C09F** *5/08, 7/10;* **C11C** *3/00, 3/02*

U.S. Cl. 260—410 **14 Claims**

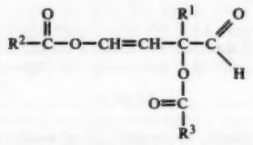
1. A process for the preparation of a 2-alkyl-4,4-diacyloxybut-2-enal of the formula



I

where R^1 is alkyl of 1 to 5 carbon atoms and R^2 and R^3 are each hydrogen, an aliphatic radical of 1 to 15 carbon atoms, a cycloaliphatic radical of 5 to 7 carbon atoms or an aromatic radical, which process comprises:

rearranging a 2-alkyl-2,4-diacyloxybut-3-enal of the formula



II

where R^1, R^2 and R^3 have the above meanings, into the product I by treatment with an aliphatic carboxylic acid in the absence of strong acids at a temperature of about 20° to 200° C. and for a treatment period of about 0.5 to 40 hours.

4,521,343
PROCESS FOR SEPARATING FATTY ACIDS FROM ROSIN ACIDS WITH PHOSPHORUS MODIFIED ALUMINA MOLECULAR SIEVE

Tai-Hsiang Chao, Mt. Prospect, and Michael T. Cleary, Elmhurst, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Feb. 4, 1983, Ser. No. 463,771

Int. Cl.[3] **C11C** *1/08;* **C09F** *1/00*

U.S. Cl. 260—419 **14 Claims**

1. A process for separating a fatty acid from a mixture comprising a fatty acid and a rosin acid, which process employs a molecular sieve comprising silicalite in a phosphorus modified alumina matrix the precursor of said molecular sieve comprising silicalite powder dispersed in an alumina hydrosol commingled with a phosphorus containing compound, the phosphorus to aluminum molar ratio in said molecular sieve being from 1:1 to 1:100, which process comprises the steps of:

(a) maintaining net liquid flow through a column of said molecular sieve in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones;

(b) maintaining a retention zone in said column, said zone defined by the molecular sieve located between a feed inlet stream at an upstream boundary of said zone and a raffinate outlet stream at a downstream boundary of said zone;

(c) maintaining a purification zone immediately upstream from said retention zone, said purification zone defined by the molecular sieve located between an extract outlet stream at an upstream boundary of said purification zone and said feed inlet stream at a downstream boundary of said purification zone;

(d) maintaining a displacement zone immediately upstream from said purification zone, said displacement zone defined by the molecular sieve located between a displacement fluid inlet stream at an upstream boundary of said zone and said extract outlet stream at a downstream boundary of said zone;

(e) passing said feed stream into said retention zone at separation conditions to effect the selective retention of fatty acid by said molecular sieve in said retention zone and withdrawing a raffinate outlet stream from said retention zone;

(f) passing a displacement fluid into said displacement zone at displacement conditions to effect the displacement of said fatty acid from the adsorbent in said displacement zone;

(g) withdrawing an extract stream comprising said fatty acid and displacement fluid from said displacement zone;

(h) periodically advancing through said column of molecular sieve in a downstream direction with respect to fluid flow in said retention zone, the feed inlet stream, raffinate outlet stream, displacement fluid inlet stream, and extract outlet and raffinate outlet streams.

4,521,344
CYANO-DICARBOXYLATE

Jacob S. Tou, and Alfred A. Schlepphik, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 413,009, Apr. 30, 1982, Pat. No. 4,442,298. This application Sep. 12, 1983, Ser. No. 531,095

Int. Cl.[3] **C04C** *121/66*

U.S. Cl. 260—465 D **1 Claim**

1. Dimethyl 2-phenyl-3-cyano-6-bromohexane-3,4-dicarboxylate.

4,521,345
AROMATIC COUPLING PROCESS

G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 4, 1984, Ser. No. 607,272

Int. Cl.[3] **C07C** *121/75*

U.S. Cl. 260—465 F **11 Claims**

1. A process which comprises reacting a 3-cyano-1-nitrobenzene having a replaceable hydrogen in the 4-position with a phenol having a replaceable hydrogen in the 4-position in an inert solvent and in the presence of a strong base to form a 4-(2-cyano-4-nitrophenyl)phenol.

11. 2,6-Di-t-butyl-4-(2′-cyano-4′-nitrophenyl)phenol.

4,521,346
PROCESS FOR PREPARING CHLORODIPHENYLPHOSPHANE

Hans-Jerg Kleiner, Kronberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Apr. 29, 1983, Ser. No. 489,812

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216379

Int. Cl.[3] **C07F** *9/52*

U.S. Cl. 260—543 P **8 Claims**

1. A process for preparing chlorodiphenylphosphane, which comprises reacting triphenylphosphane and dichlorophenylphosphane in the absence of a catalyst at a temperature between about 300° and 700° C.

4,521,347
PROCESS FOR PREPARING CHLOROPHENYLPHOSPHANES

Hans-Jerg Kleiner, Kronberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Apr. 29, 1983, Ser. No. 489,813

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216381

Int. Cl.³ C07F 9/52

U.S. Cl. 260—543 P **7 Claims**

1. A process for preparing a chlorophenylphosphane of the formula

$$(C_6H_5)_nPCl_{3-n}$$

in which n is 1 or 2, which comprises reacting triphenylphosphane and phosphorus trichloride in the absence of a catalyst at a temperature of from about 320° to 700° C.

4,521,348
PHOSPHORUS-CONTAINING CYANOHYDRINE DERIVATIVES

Manfred Finke, Kelkheim, and Rainer Mündnich, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

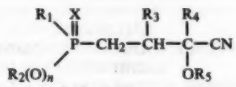
Continuation of Ser. No. 92,456, Nov. 8, 1979, abandoned. This application Dec. 30, 1983, Ser. No. 565,850

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849003

Int. Cl.³ C07F 9/32, 9/53; C07C 121/34

U.S. Cl. 260—940 **2 Claims**

1. Compounds of the formula I



in which
R_1 is alkyl;
R_2 is alkyl;
R_3 and R_4, independently from each other, are hydrogen or $(C_1$–$C_4)$-alkyl;
R_5 is acetyl, ethoxycarbonyl, propionyl, or benzoyl;
X is oxygen or sulfur, and
n is zero or 1.

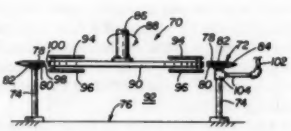
4,521,349
FLUID DIFFUSER FOR GASES AND LIQUIDS

Richard B. Weber; George M. Wilfley, both of Denver, and George M. Wilfley, Castle Rock, all of Colo., assignors to A. R. Wilfley and Sons, Inc., Englewood, Colo.

Filed Jan. 20, 1983, Ser. No. 459,343

Int. Cl.³ B01F 3/04

U.S. Cl. 261—93 **39 Claims**



1. A fluid diffuser for dispersing a gas or liquid into a body of receiving liquid in which it is immersed, which comprises:
(a) a rotatable shaft;
(b) a thin disk-like member mounted for rotation on said rotatable shaft perpendicular to the axis of rotation thereof, said disk-like member having a top surface, a bottom surface, an outer circumferential surface connecting said top and bottom surfaces and having an outer perimeter, the ratio of the overall diameter of said member to the maximum thickness thereof being at least about 8:1;
(c) a separate stationary fluid-emitting annular ring positioned adjacent but spaced outwardly from the outer perimeter of said disk-like member, said ring having a top wall, a bottom wall, an inner circumference and an outer circumference, said top and bottom walls defining at least one fluid plenum, at least one of said top and bottom walls of said annular ring being porous in at least a portion thereof, with a foraminous surface to permit the passage of fluid through said wall to the outer surface of said ring so that the introduction of fluid into said plenum will cause fluid to flow out through said porous wall to produce small nascent fluid spheroids on said foraminous surface of the annular ring, which nascent spheroids are sheared off to form still finer particles of fluid by the viscous shear forces exerted by said liquid when said disk-like member rotates about its axis of rotation while immersed in said body of receiving liquid, at least the inner portion of the foraminous surface of said at least one porous wall of said at least one plenum lying in generally the same plane as at least the outer portion of the corresponding one of the top and bottom surfaces of said disk-like member; and
(d) a feed line in operative connection with said plenum for fluid to be introduced under pressure into said at least one plenum of said annular ring and from there into the body of receiving liquid as aforesaid.

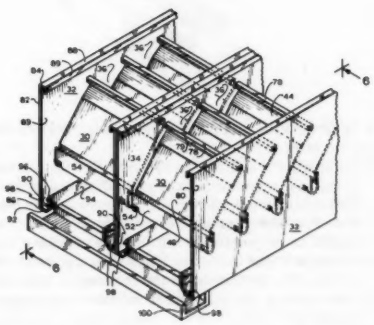
4,521,350
DRAINAGE COLLECTION SYSTEM

Marcel R. Lefevre, Ft. Myers, Fla., assignor to The Munters Corporation, Ft. Myers, Fla.

Filed Jan. 16, 1984, Ser. No. 570,758

Int. Cl.³ B01F 3/04

U.S. Cl. 261—111 **16 Claims**



1. A drainage collection system for use in an evaporative cooling tower, the drainage collection system being disposed transversely across the flow of air within the cooling tower and below a gas/liquid heat exchanging contact body to receive liquid gravitating therefrom and to collect the same, the drainage collection system comprising:
a plurality of liquid collection plates, the collection plates being arranged in parallel and inclined from the vertical, adjacent ones of the collection plates defining therebetween flow through channels for the substantially unimpeded passage of air therethrough, each of the plates having upper and lower end portions with the upper end portion of each overlapping the lower end portion of a respectively adjacent plate, the plates being shaped over a central portion thereof to form substantially planar sections each having a different predetermined slope, the

slope of some of the sections being selected in dependence upon the distances between the contact body and the plate sections to enable the plates to receive and collect substantially all of the liquid gravitating from the contact body onto the plates, the lower end portion of each of the plates being shaped to form a primary collecting channel extending substantially across the width of its respective plate for collecting liquid directed thereto by the plate, the primary collecting channels having outlet ports formed therein for the drainage of liquid collected thereby; and

a support frame for the collection plates, the frame including substantially vertical side supports disposed on corresponding opposite sides of the collection plates with the collection plates extending between the side supports, the disposition of the plates with respect to the side supports providing the frame with torsional strength, the side supports including lower portions shaped to form troughs disposed below the outlet ports of the collection plates to receive liquid discharged therethrough.

4,521,351

PROCESS FOR PRODUCING LIGHT-TRANSMITTING ELEMENT OF SYNTHETIC RESIN

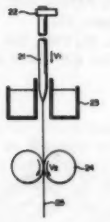
Yasuji Ohtsuka; Yasuhiro Koike, both of Tokyo, and Motoaki Yoshida, Nishinomiya, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Sep. 16, 1983, Ser. No. 533,532

Claims priority, application Japan, Jan. 27, 1983, 58-11954; Jan. 27, 1983, 58-11956

Int. Cl.³ G02B 5/14

U.S. Cl. 264—1.5 **2 Claims**



1. A process for producing a light-transmitting element of a synthetic resin, which comprises

(1) preparing a mixture composed of at least three monomers, said monomers having a difference in the ease of polymerization under given polymerization conditions, and that monomer in the monomeric mixture which is easiest to polymerize being capable of giving a polymer having a lower refractive index than a polymer from any of the other monomers in the monomeric mixture,

(2) maintaining the monomeric mixture in a predetermined shape, and

(3) thereafter applying to the monomeric mixture maintained in the predetermined shape such polymerization conditions that polymerization begins at the outside portion of the predetermined shape of the monomeric mixture and proceeds gradually toward its inside portion, thereby to form a polymeric article in which the proportion of polymer units derived from the monomer which is easiest to polymerize is largest at said outside portion and gradually decreases toward its inside portion and the refractive index of the article is lowest at said outside portion and gradually increases toward its inside portion;

wherein when three monomers of said monomeric mixture are designated as M_1, M_2 and M_3, the mole ratios of these monomers with each other are represented by $(M_1/M_2)_m$, $(M_1/M_3)_m$ and $(M_2/M_3)_m$, and the reactivity ratios of these monomers to each other are represented in accordance with an ordinary definition by r_{12}, r_{13}, r_{21}, r_{23}, r_{31} and r_{32}, said monomeric mixture contains monomers satisfying the following three formulae

$$\{r_{12}(M_1/M_2)_m+1\}/\{(M_1/M_2)_m+r_{21}\}>1.1,$$

$$\{r_{13}(M_1/M_3)_m+1\}/\{(M_1/M_3)_m+r_{31}\}>1.1,$$

$$\{r_{23}(M_2/M_3)_m+1\}/\{(M_2/M_3)_m+r_{32}\}>1.1,$$

as said at least three monomers.

4,521,352

MICROENCAPSULATION PROCESS

Lawrence T. Hayworth, Basingstoke, England, assignor to Mars, Incorporated, McLean, Va.

PCT No. PCT/GB82/00249, § 371 Date Apr. 6, 1983, § 102(e) Date Apr. 6, 1983, PCT Pub. No. WO83/00449, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 9, 1982, Ser. No. 486,955

Claims priority, application United Kingdom, Aug. 11, 1981, 8124563

Int. Cl.³ B01J 13/02

U.S. Cl. 264—4.3 **11 Claims**

1. A process for microencapsulating an aqueous amine solution, which process comprises emulsifying the aqueous amine solution in a hydrophobic organic liquid to form droplets, reacting the amine with a polybasic acid chloride or anhydride to form a polymer membrane around individual droplets by interfacial polymerization, and then terminating the polymerization reaction by introducing water into the hydrophobic organic liquid by adding to the reaction mixture a solution of water in an organic liquid, which solution of water is wholly miscible with the hydrophobic organic liquid.

4,521,353

PROCESS FOR PRODUCING ENCAPSULABLE GLOBULES

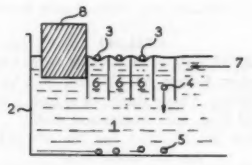
Guy Bonnot, Collognes au Mont d'Or; Pierre Laviolette, Chassieu; Andre Potiron, Maurepas, and Jean-Yves Deysson, Paris, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Filed May 9, 1983, Ser. No. 492,700

Claims priority, application France, May 12, 1982, 82 08288

Int. Cl.³ B29C 6/00

U.S. Cl. 264—8 **8 Claims**



1. Process for producing generally spherical globules, subsequently encapsulable by means of a film polymerised in situ, applicable particularly to the production of breeding substrates for entomophagous insects in the form of artificial lepidoptera eggs, in which process drops are frozen for their encapsulation, and comprising the stages of:

forming a jet of a substance to be frozen in the form of drops and spraying said jet by dispersion of said jet;

collecting said drops on a grid, provided with cells which is held at the surface of a bath of cryogenic liquid having a density less than that of said substance;

floating said drops on the surface of said bath by a calefaction phenomenon, each drop isolated in a cell of said grid until freezing, so as to form generally spherical frozen globules;

sifting the frozen globules derived from the drops on at least one sieve immersed in the bath beneath said cellular grid.

4,521,354

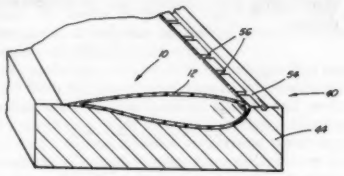
METHOD AND MOLD FOR FABRICATING AN AERODYNAMIC AIRFRAME STRUCTURE

Claude W. Engelke; Gerald E. Sutton, and Steven E. Potter, all of Wichita, Kans., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 361,848, Mar. 25, 1982, abandoned. This application Dec. 23, 1983, Ser. No. 564,850

Int. Cl.³ B29D *27/00*; B29F *1/03, 1/06*

U.S. Cl. 264—46.6 **5 Claims**



1. A method of fabricating an aerodynamic airframe structure and the like using a mold having halves with a cavity formed therein, the cavity designed for receiving an external stiffener skin having injection holes along the length thereof, the mold further having an entrance connected to a runner along one side of the cavity and a series of gates joining the runner to the cavity and indexed with the injection holes, the steps including:

mixing a foam material in a mixing chamber;

introducing the mixed foam material under pressure into the entrance of the mold;

feeding the mixed foam material along the length of the runner and through the gates;

filling the external skin in the cavity from the gates through the injection holes with the foam material, the foam material adhering to the skin and forming an elastic foundation for the external skin; and

curing the airframe structure and removing the halves of the mold therefrom.

4,521,355

METHOD OF PRODUCING CERAMIC WARE

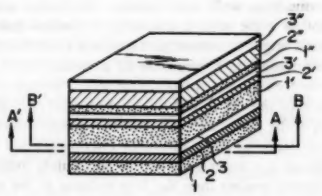
Nobuyuki Kitajima, Tokyo; Yoshinori Tachibana, Kawagoe; Asashi Muraki, and Shinichi Kuzuoka, both of Yokohama, all of Japan, assignors to Toppan Printing Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 397,835, Jul. 13, 1982, abandoned. This application Sep. 19, 1983, Ser. No. 533,882

Claims priority, application Japan, Jul. 29, 1981, 56-118618

Int. Cl.³ C04B *33/34*

U.S. Cl. 264—60 **11 Claims**



1. A method of producing patterned ceramic ware, comprising the steps of adding a polymer flocculant and an inorganic flocculant to each of at least two different aqueous suspensions each containing a fibrous material, a ceramic raw clay and, as required, a colorant such as ceramic picturing pigment, so as to enable the clay, or both clay and colorant, to be adsorbed on the surface of the fibrous material; preparing from the suspensions, by the ordinary wet paper-making method, at least two kinds of ceramic raw material wet sheets differing from each other in color after firing; performing a stacking-cutting operation at least once, in which the different kinds of the wet sheets are alternately stacked; mechanically cutting the stacked wet sheets, using a cutter selected from a circular saw, a fretsaw and an ordinary saw, in a direction not parallel with the surface of the raw material sheet when the water content of the sheets is 20 to 50% by weight; forming the resultant sheet into a desired shape; and subsequently firing the shaped mass.

4,521,356

DECORATIVE FLATWARE HANDLES AND PROCESS FOR THEIR PREPARATION

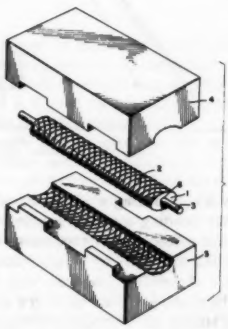
Hartmut Keller; Axel Krauth, and Roswitha Kreiner, all of Selb, Fed. Rep. of Germany, assignors to Rosenthal Aktiengesellschaft, Selb, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 379,006

Claims priority, application Fed. Rep. of Germany, May 21, 1981, 3120152

Int. Cl.³ C04B *41/42*

U.S. Cl. 264—60 **8 Claims**



1. A process for preparing a ceramic flatware handle comprising the steps of:

(a) forming a mixture of powdered ceramic raw materials;

(b) drying the mixture;

(c) intermixing the ceramic mass from 15 to 25 weight percent of a thermoplastic plasticizing mixture comprising 12 to 18 weight percent of a binder and 3 to 7 weight percent of a release agent based on the weight of the ceramic mass;

(d) shaping the resulting plastic mixture into blanks at a temperature from 90° to 150° C;

(e) pressing a relief pattern on the ceramic blanks at a temperature from 60° to 80° C.;

(f) degassing the binder component at a temperature up to about 300° C.; and

(g) firing the handle at a temperature from 1350° to 1550° C.

4,521,357

CARBON BONDED REFRACTORIES

Mark C. Kernion, N. Braddock, and Albert L. Renkey, Bridgeville, both of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed May 2, 1983, Ser. No. 490,816

Int. Cl.³ C04B *35/52*

U.S. Cl. 264—63 **3 Claims**

1. Method of making carbon bonded refractory brick consisting essentially of mixing about 1 to 6%, by weight, carbonaceous liquid thermosetting resin, up to about 20%, by weight,

carbonaceous material, up to about 10%, by weight, of one or more powdered metals selected from the group consisting of silicon, magnesium and aluminum, and at least 70%, but less than 100%, by weight, refractory aggregate, pressing the mixture to form shapes, baking the shapes to cure the resin and impregnating the shapes with tar or pitch.

4,521,358

PROCESS FOR THE PRODUCTION OF SILICON NITRIDE SINTERED BODIES

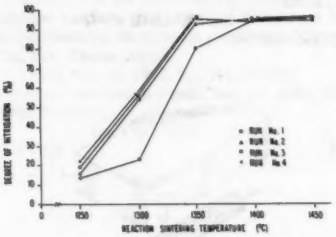
Kazunori Miura; Yoshinori Hattori, and Yasushi Matsuo, all of Aichi, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,283

Claims priority, application Japan, Aug. 12, 1982, 57-139149; Aug. 12, 1982, 57-139150

Int. Cl.³ C04B *35/58*

U.S. Cl. 264—65 **7 Claims**



1. A process for producing a silicon nitride sintered body which comprises molding a mixed powder of 100 parts by weight of metallic silicon with a maximum particle size of 20 μm or less and 0.2 to 2 parts by weight (calculated as chromium oxide) of a chromium component and, thereafter, reaction sintering the above-prepared mold in a nitrogen gas or in a non-oxidizing atmosphere containing nitrogen gas at temperature of 1,300° to 1,500° C.

4. A process for producing a silicon nitride sintered body which comprises molding a mixed powder of 100 parts by weight of metallic silicon with a maximum particle size of 20 μm or less, 0.2 to 1 part by weight (calculated as chromium oxide) of a chromium component, and further 10 to 20 parts by weight of an oxide component of one or more of the oxides of yttrium, lanthanum, cerium, gadolinium and erbium, reaction sintering the above-prepared mold in a nitrogen gas or in a non-oxidizing atmosphere containing nitrogen gas, and thereafter, hot pressing the reaction sintered body.

4,521,359

METHOD OF COEXTRUDING PLASTICS TO FORM A COMPOSITE SHEET

Hsue C. Tsien, Chatham Township, Morris County, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 4, 1981, Ser. No. 327,274

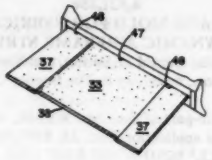
Int. Cl.³ B29D *9/08*

U.S. Cl. 264—104 **16 Claims**

1. A method of producing a composite sheet of dissimilar plastic materials, comprising the steps of:

(a) matching at least two dissimilar plastic materials with respect to their melt indices; and

(b) coextruding said matched plastic materials with a side-by-side orientation while hot and soft to form a composite



sheet having a substantially uniform demarcation therebetween.

4,521,360

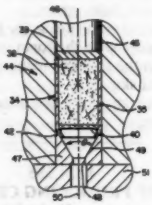
METHODS OF COMPACTION BY INCREMENTAL RADIAL COMPRESSION AND/OR LOW-RATIO EXTRUSION

Robert J. Fiorentino, Worthington, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Sep. 12, 1983, Ser. No. 531,077

Int. Cl.³ B29D *3/02*

U.S. Cl. 264—108 **18 Claims**



1. A method of consolidating particulate materials into a compact, comprising:

a. enclosing the unconsolidated particulate material in a supporting can including a surrounding wall and end closures to confine a first volume of particulate material;

b. applying pressure on one end closure while confining the surrounding wall and forcing the other end closure through a die with a convergent portion having an included angle of convergence of less than about 90°; and

c. continuing the application of pressure on the one end while forcing the surrounding wall through the convergence of the die to provide incremental radical compression of the particulate material as it passes through the die, decreasing the first volume of unconsolidated particulate material to a second volume of particulate material which becomes smaller than the first volume in the convergent portion, and to produce a compact with substantially one hundred percent of the possible compactable density of the consolidated material, the area of cross-section of the particulate compact being between about one and seven times the area of cross-section of the compact passing through the aperture of the die.

4,521,361
AQUEOUS PLASTIC MOLDING COMPOSITIONS BASED ON CERAMIC RAW MATERIALS CONTAINING AIR-DRYING AND SINTERABLE ADDITIVES

Werner Sommer, Bad Soden, Fed. Rep. of Germany, assignor to T+F Kunststuffe fur Tecknik und Freizeit GmbH, Dreieich, Fed. Rep. of Germany

Continuation of Ser. No. 343,542, Jan. 28, 1982, abandoned. This application Aug. 1, 1983, Ser. No. 518,829

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103813

Int. Cl.³ B27J *5/00*; D04H *1/54*

U.S. Cl. 264—126 **3 Claims**

1. An aqueous plastic molding composition based on more than 50% of mineral ceramic raw materials and a binder having less than 5% binder polymer present in the form of an aqueous dispersion or solution of organic resin the remainder being sinterable thermoplast and water:

said binder including a dual system including a first member selected from the group consisting of water-soluble, high molecular weight, film-forming agents, and water-dispersed, air-drying high molecular weight, film-forming agents, and a second member comprising water-insoluble thermoplasts of fine particulate form sinterable at temperatures below 250° C., and wherein the ratio of said mineral materials to said organic resin on a dry substance base is in the range of about from about 95:5 to about 60:40 by weight.

4,521,362
METHOD AND APPARATUS FOR MAKING A POLYMERIC COATED LAYER

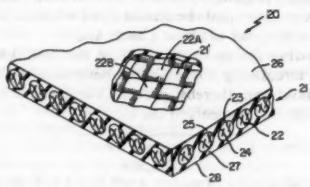
Joseph V. Tassone, Kettering, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 489,924, Apr. 29, 1983, Pat. No. 4,473,521. This application Jun. 4, 1984, Ser. No. 617,041

The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.

Int. Cl.³ B29G *5/00*

U.S. Cl. 264—136 **24 Claims**



1. In a method of making a polymeric coated layer means comprising the steps of providing a layer of strand means with said strand means disposed in a predetermined pattern, forming said layer of strand means to comprise a first substantially planar layer of strands disposed in superimposed relation with a second substantially planar layer of strands whereby said strands of said first layer are not woven with said strands of said second layer, disposing a liquid polymeric coating on said layer of strand means while said strand means thereof are disposed in said pattern thereof, doctoring said coating, stretching said layer of strand means in one direction after said step of disposing said coating thereon, and drying said coating with a heating meanas to at least a degree thereof that will hold said strand means of said layer thereof in substantially said pattern thereof whereby said coating effectively is the sole securement means securing said strands of said first layer to said strands of said second layer and thereby imparts its flexible characteristic to said securement means between said strands of said first and second layers, the improvement wherein said step of doctoring said coating takes place after said step of stretching said layer of strand means and wherein said step of stretching said layer of strand means takes place after said heating means has dried said coating to at least a degree thereof that the stretching of said layer of strand means causes an outward thickening of said coating from said layer of strand means.

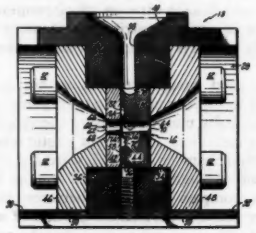
4,521,363
EXTRUSION OF A PLASTIC COATING ABOUT A STRAND

Ralph A. Vogel, Three Rivers, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Jan. 23, 1984, Ser. No. 573,172

Int. Cl.³ B29F *3/10*

U.S. Cl. 264—174 **5 Claims**



1. In an apparatus for extruding a thin uniform coating of fluent plastic material about a moving strand advancing longitudinally through a die assembly into which a stream of fluent plastic material is forced by an extruder, the improvement wherein said die assembly comprises:

a guide member and an extrusion die member in axially aligned relation with a longitudinally extending continuous bore formed therein through which the moving strand travels from an entry end to an exit end;

the portion of said bore adjacent said entry end being located within said guide member and dimensioned to serve as a guide for moving strand traveling longitudinally through said bore;

the portion of said bore adjacent said exit end being located within said die member and being in the form of a frustrum of a cone with its smaller end at said exit end and its larger end proximate to and in communication with said entry end portion; said exit end being of a size providing a clearance of from about 0.001 to 0.004 inch on the diameter of the moving strand; the frustro-conical inner surface of said exit end portion extending over a length substantially greater than the diameter of the moving strand and being tapered at an included angle of from about 0.5° to 8°; the clearance of said inner surface over the moving strand defining a hydrodynamic pressure centering chamber to cause the plastic material carried by the moving strand to develop hydrodynamic pressure forces effective to maintain the moving strand centered within said exit portion;

a circumferential channel proximate to said guide member which is spaced from and coaxial with said bore to define an annular distribution chamber concentric with said bore;

supply passages of substantially equal lengths leading to circumferentially spaced locations in said distribution chamber for feeding said distribution chamber with plastic material from an extruder; and

a constricted annular feed passage of uniform annular width and length extending radially inward from said distribution chamber to a portion of said bore intermediate the outlet of said entry end portion and the larger end of said exit end portion to direct a thin cross section of the plastic material radially inward onto the moving strand with substantially uniform volumetric flow of the plastic material circumferentially of the moving strand; the axial length of said intermediate bore portion being not substan-

tially greater than the annular width of said feed passage thereby minimizing the application of shear stress to the plastic material which is directed onto the moving strand.

5. A method of extruding a thin uniform coating of fluent plastic material about a strand advancing longitudinally through a die assembly into which a stream of fluent plastic material is forced, said method comprising the steps of:

continuously advancing said strand at a constant speed through an entry end portion of a continuous bore formed in a die assembly; said entry end portion being dimensioned to serve as a guide for the advancing strand;

forcing a stream of fluent plastic material into said die assembly;

dividing said stream of fluent plastic material into equal branch streams;

directing said branch streams to circumferentially spaced points in an annular distribution chamber within said die assembly which is spaced from and concentric with said bore;

combining said branch streams within said distribution chamber to form an annular pool of fluent plastic material of substantially uniform pressure therethrough;

directing a radial stream of fluent plastic material from said distribution chamber radially inward and onto the advancing strand through a constricted annular feed passage of uniform compass extending between said distribution chamber and an intermediate portion of said bore at the outlet of said entry end portion, thereby providing a symmetrical flow of the fluent plastic material onto the advancing strand; and

passing the advancing strand with the radial stream of fluent material adhering thereto through a conically converging exit end portion of said bore which is convergent toward the exit end of said bore at an included angle of from about 0.5° to 8°, thereby effecting a hydrodynamic circumferential centering action upon the fluent plastic material adhering to the advancing strand which centers the latter within said exit end portion.

4,521,364

FILAMENT-LIKE FIBERS AND BUNDLES THEREOF, AND NOVEL PROCESS AND APPARATUS FOR PRODUCTION THEREOF

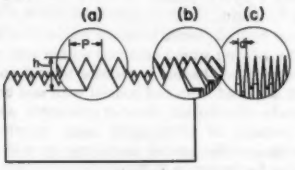
Susumi Norota; Tsutomu Kiriyama; Tadashi Imoto, and Toshinori Azumi, all of Iwakuni, Japan, assignors to Teijin Limited, Tokyo, Japan

Division of Ser. No. 133,288, Mar. 24, 1980, Pat. No. 4,355,075. This application Jul. 2, 1982, Ser. No. 394,891

Claims priority, application Japan, Mar. 27, 1979, 54-35008; Mar. 27, 1979, 54-35009; Jul. 16, 1979, 54-89315; Sep. 4, 1979, 54-112370

Int. Cl.³ D01D *5/088*

U.S. Cl. 264—176 F **5 Claims**



1. A process for producing a bundle of filament-like fibers by extruding a melt of a thermoplastic synthetic polymer through a spinneret having numerous small openings, which comprises extruding said melt from said spinneret, said spinneret having such a structure that discontinuous elevations are provided between adjacent small openings on the extruding side of the spinneret, and the melt extruded from one opening can move to and from the melt extruded from another opening adjacent thereto or vice versa through a depression existing between said elevations; and taking out the extrudates from the small openings while cooling them by supplying a cooling fluid to the extrusion surface of said spinneret or to its neighborhood, said cooling fluid being supplied such that the solidification length (L_f) which is defined as the distance from the surface of the elevations of the spinneret to a point at which the fine fibrous streams have a diameter 1.1 times as large as the fixed fiber diameter, is less than 1 cm, whereby said extrudates are converted into numerous separated fine fibrous streams and solidified.

4,521,365

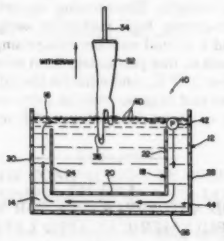
GLOVE MOLDING APPARATUS AND METHOD

Leonard D. Kurtz, Woodmere, N.Y., assignor to Bio Research Inc., Farmingdale, N.Y.

Filed Dec. 20, 1983, Ser. No. 563,450

Int. Cl.³ B29C *13/00*

U.S. Cl. 264—306 **8 Claims**



5. A method for preventing web formation between spaced elements of a mold for gloves or the like comprising the steps of:

dipping the mold in a tank containing a liquid polymer to coat the mold;

circulating a plurality of small objects floating on the surface of the polymer past the coated mold wherein said objects have a diameter of about ⅛ inch; and

withdrawing the mold slowly from the tank whereby the small circulating objects move between the elements of the mold and thereby prevent the formation of webs between the elements of the mold.

4,521,366

METHOD FOR CLOSING AND SEALING PLASTIC TUBING USING A HOT DIE AND A ROTATING COLD DIE

Joe Mason, Mundelein, and Hermann F. Eckert, Palatine, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 24, 1982, Ser. No. 392,421

Int. Cl.³ B29C *17/00*

U.S. Cl. 264—312 **3 Claims**

1. A method for sealing the open end of a plastic tube comprising the steps of:

inserting the open end of the tube into the cavity of a hot die to heat and soften the plastic while simultaneously deforming the tube walls inwardly until the walls join along a closure line, thereby forming a closed tube end;

withdrawing the heated, softened closed tube end from the hot die;

inserting the heated, softened closed tube end into the cavity of a cold die to cool the closed tube end;

while the closed tube end is being cooled, rotating the cold die about the closed tube end to disrupt the closure line and interfuse the joined tube walls along the closure line to form a homogeneous plastic mass sealing the closed tube end; and

withdrawing the closed and sealed tube end from the cold die when the closed and sealed tube end has substantially hardened.

4,521,367

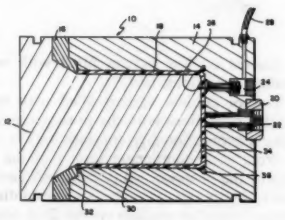
MOLD, PROCESS OF MOLDING, AND ARTICLE MOLDED BY SUCH PROCESS

J. Larry Underwood, c/o Underwood Mold Company, Inc., 104 Dixie Dr., Woodstock, Ga. 30188

Filed Nov. 16, 1981, Ser. No. 321,570

Int. Cl.³ B29F *1/14*

U.S. Cl. 264—318 **13 Claims**



1. A process for molding an article having a flange between a mold core and a unitary mold element which cooperates with the mold core to form a mold space, the flange being formed during the process as a consequence of the existence of an undercut existing in a first surface of the unitary mold element, the process comprising the steps of:

providing a ridge on a second surface of the unitary mold element adjacent the undercut,

injecting a fluid between the unitary mold element and the molded article as the core and unitary mold element separate in such a volume and at such a pressure as will maintain the article in substantially complete and constant contact with the core as the core and article are withdrawn from the unitary mold element, the flange conforming to the unitary mold element wall until the article is free from the unitary mold element, and subsequently

separating the molded article from the mold core.

4,521,368

METHOD OF MAKING INTERNALLY CROSS-RIBBED PLASTICS MATERIAL STRUCTURE

Frank B. Mercer, Blackburn, and Keith F. Martin, Lancashire, both of England, assignors to Netlon Limited, Blackburn, England

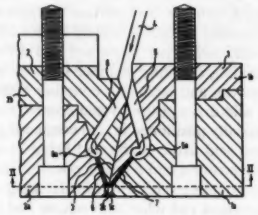
Filed Jul. 1, 1983, Ser. No. 510,253

Claims priority, application United Kingdom, Jul. 6, 1982, 8219458

Int. Cl.³ B29D *23/04*

U.S. Cl. 264—514 **9 Claims**

1. A method of producing a unitary, tubular, plastics material structure, comprising coaxially extruding in a single operation a tubular inner layer, a tubular outer layer and, between the layers, an inner set and an outer set of helical elements, the helices being oppositely handed and the helical elements forming a biplanar mesh, the inner helical elements being united with the inner layer, the inner and outer helical elements being united with each other at their cross-over points, and the outer helical elements being united with the outer layer, in each case



the uniting being performed by integral or confluent extrusion whereby said plastics material structure comprises interconnected spaces between said inner and outer layers, defined between adjacent said helical elements of said inner set and between adjacent said helical elements of said outer set.

4,521,369

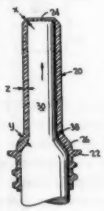
METHOD OF MAKING MOLECULARLY ORIENTED PLASTIC BOTTLES

John A. Marcinek, Westfield, Mass., assignor to Emhart Industries, Inc., Farmington, Conn.

Division of Ser. No. 56,426, Jul. 10, 1979, Pat. No. 4,432,530, which is a continuation-in-part of Ser. No. 863,746, Dec. 23, 1977, abandoned. This application Jan. 3, 1984, Ser. No. 567,517

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—532 **6 Claims**



1. Process of manufacturing a molecularly oriented plastic bottle comprising the steps of (1) providing an injection molded plastic parison having a bottom wall portion, a sidewall portion, a shoulder portion and a neck finish, said bottom wall portion having a flat area and there being an annular corner area joining said bottom wall and sidewall portions, said bottom wall portion having a thickness less than the thickness of said sidewall portion with there being a rapid transition from said flat of said bottom wall to said sidewall portion with said sidewall thickness being substantially constant from said annular corner area to said shoulder portion; (2) positioning said parison in a stretch/blow mold; and (3) stretch/blowing said parison in said blow mold to form a finished bottle.

4,521,370

CONTROL OF NUCLEAR REACTORS

Larry E. Fischer, Los Gatos, and Jackie E. Bean, Santa Clara, both of Calif., assignors to General Electric Company, San Jose, Calif.

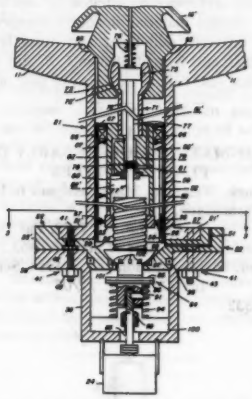
Filed Jul. 8, 1982, Ser. No. 396,394

Int. Cl.³ G21C *19/20*

U.S. Cl. 376—233 **1 Claim**

1. In a vertically oriented control rod drive device posi-

tioned beneath a pressure vessel for selectively inserting a control rod into a nuclear reactor core in said pressure vessel including a tubular drive housing secured to the bottom of said pressure vessel and extending downward therefrom; a lower housing secured to and closing the lower end of said drive housing; a drive piston having an upper head portion and a lower, elongated, annular skirt portion reciprocably disposed in said drive housing including sealing means for providing a fluid seal between said drive piston and said drive housing; an upwardly extending coupling member secured to the top end of said drive piston and including coupling means for releasably coupling said drive piston to said control rod; a coupling release rod coaxially positioned in said connecting member and penetrating into said drive piston and being reciprocable between an upper position and a lower position; latching means secured to said coupling release rod for latching said coupling means to said control rod when said release rod is in its lower



position and for releasing said coupling means from said control rod when said release rod is in its upper position; means for admitting a drive fluid at a pressure higher than the pressure in said pressure vessel to the under side of said drive piston for rapid fluid drive insertion of said control rod into said core; a stabilizing arrangement for preventing movement of said coupling release rod toward its upper position and consequent release of said coupling means during fluid drive of said drive piston comprising: a cylindrical chamber in said drive piston surrounding said release rod; an annular chamber piston in said chamber secured to said release rod for reciprocating therewith; a first fluid passage from the under side of said drive piston to the upper end of said chamber; and a second fluid passage from the upper end of said drive piston to the lower end of said chamber whereby during fluid drive of said drive piston the net force on said chamber piston is downward to maintain said release rod in its lower position whereby said control rod remains coupled to said drive piston.

4,521,371

VESSEL LIQUID LEVEL INDICATION

Daniel A. Peck, South Windsor, and Vincent M. Callaghan, West Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 16, 1981, Ser. No. 331,419
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—245 **15 Claims**

1. In a nuclear steam supply reactor coolant system having a plurality of fluidly connected components including a nuclear reactor vessel, a steam generator, pump means, and pressurizer, each resting on at least one vertical support member which in turn is connected to a respective base, a method of determining the fluid content in the reactor vessel comprising:

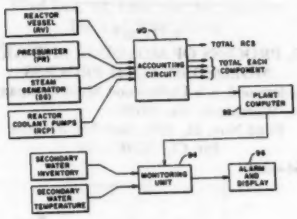
attaching a strain gauge to a vertical support member of each of said components whereby a change in the strain on each support member due to vertical stress is sensed by each gauge;

receiving the output signals of the strain gauges at a central processing location;

calibrating the gauges during the start up testing of the reactor coolant system by recording the output signals indicative of support member strain measured at a variety of plant conditions including,

a. no water in the reactor coolant system,

b. the reactor coolant system filled with water at ambient temperature,



c. the reactor coolant system filled with water at hot operating conditions, and

d. the reactor coolant system filled with water at hot operating conditions with the pressurizer drained;

determining a proportionality constant for the strain gauge output from each component such that the sum of the products of the proportionality constants and the change in respective strain gauge outputs is substantially equal to the change in reactor coolant system fluid content during calibration;

after completing the start up testing, monitoring the strain gauge signals at the central processing location and generating display signals indicative of the total fluid content of the reactor coolant system and the fluid content of at least the reactor vessel component.

4,521,372

APPARATUS AND METHOD FOR MONITORING STORED MATERIAL

William E. Price, Houston, Tex.; Louie A. Galloway, III, Lafayette, La.; Charles B. Lowrey, Beaumont, and Donald R. Lewis, San Antonio, both of Tex., assignors to Nuclear Monitoring Systems & Management Corporation, Houston, Tex.

Filed Aug. 26, 1981, Ser. No. 296,429
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—250 **36 Claims**

8. A storage system for the monitored retrievable storage of radioactive material comprising

a first container for containing radioactive material;

a second container for containing said first container;

a storage cell containing said second container;

a first conduit for transporting a first fluid to a cavity between said first container and said second container when said first container is contained within said second container;

a second conduit for transporting said first fluid from said cavity between said first container and said second container;

pump means connecting said first conduit and said second conduit for moving said first fluid through said first conduit, through said cavity between said first container and said second container, through said second conduit, through said pump means and back into said first conduit in a continuous closed loop of fluid flow, said closed loop

of fluid flow through said cavity covering substantially the entire exterior surface of said first container;

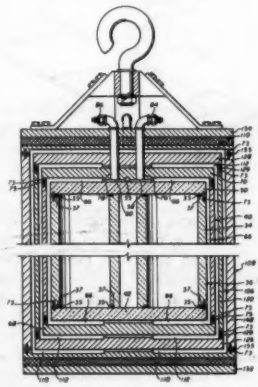
a radiation detector located within said closed loop of fluid flow for measuring the level of radioactivity present in said first fluid flowing through said closed loop of fluid flow;

a detector for detecting a second fluid located within said closed loop of fluid flow for detecting the presence of said second fluid in said first fluid flowing through said closed loop of fluid flow;

a volume measuring unit located within said closed loop of fluid flow for measuring a change in the volume of said first fluid in said closed loop of fluid flow;

a flowmeter located within said closed loop of fluid flow for measuring the rate of flow of said first fluid flowing through said closed loop of fluid flow;

a computer having at least one first input line connected to said radiation detector for transmitting a first signal to said computer when said radiation detector detects the presence of a level of radioactivity in said first fluid flowing through said closed loop of fluid flow that is not within a predetermined range of levels of radioactivity due to leakage of said radioactive material from said first container, said computer having means for monitoring said first input line to detect said first signal and having means to indicate that said computer has detected said first signal on said first input line; and



said computer having at least one second input line connected to said detector for detecting said second fluid for transmitting a second signal to said computer when said detector for detecting said second fluid detects the presence of a volume of said second fluid in said first fluid that is not within a predetermined range of volumes of second fluid, said volume of said second fluid being due to leakage of said second fluid into said closed loop of fluid flow from outside said second container, said computer having means for monitoring said second input line to detect said second signal and having means to indicate that said computer has detected said second signal on said second input line; and

said computer having at least one third input line connected to said volume measuring unit for transmitting a third signal to said computer when said volume measuring unit detects a change in the volume of said first fluid in said closed loop of fluid flow that causes the volume of said first fluid to not be within a predetermined range of volumes, said computer having means for monitoring said third input line to detect said third signal and having means for indicating that said computer has detected said third signal on said third input line; and

said computer having at least one fourth input line connected to said flowmeter for transmitting a fourth signal to said computer when said flowmeter detects a rate of flow of said first fluid flowing through said closed loop of fluid flow that is not within a predetermined range of rates of flow, said computer having means for monitoring said fourth input line to detect said fourth signal and having means for indicating that said computer has detected said fourth signal on said fourth input line; and

means for retrieving said second container and said first container from said storage cell when leakage of said radioactive material from said first container is detected or when said second fluid from outside said second container is detected.

4,521,373

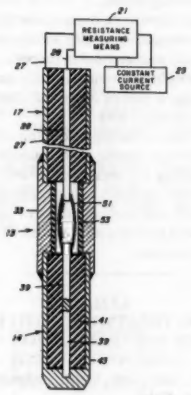
LIQUID LEVEL SENSOR

James H. Terhune, and John P. Neissel, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 23, 1982, Ser. No. 410,578

Int. Cl.³ G21C *17/00*

U.S. Cl. 376—258 **8 Claims**



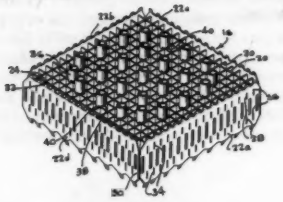
1. A liquid level detector for insertion into the pressure vessel of a nuclear reactor, said pressure vessel suitable for containing liquid and gaseous material, said detector comprising coaxial means for conducting electricity, said coaxial means including an inner conductor and an outer conductor separated by an insulative sleeve, said coaxial means being electrically connected to a source of constant current and a resistance measuring means; a sensing means for responding positively in terms of electrical resistance to an increase in temperature; a heat-conductive and electrically-insulative sleeve means for laterally surrounding said sensing means; an electrically-conductive and heat-conductive jacket means for laterally surrounding said sleeve means, said sensing means and said jacket means being electrically connected at a common end; and thermally limiting means for electrically connecting the outer conductor of said coaxial means with said jacket means, surrounding resilient sleeve means for electrically connecting said inner conductor of said coaxial means with said sensing means, whereby the level of liquid in said pressure vessel is detectable in terms of a variation in resistance of said sensing means.

4,521,374

FUEL GRID WITH SLEEVES WELDED IN NOTCHED GRID STRAPS

Robert Duncan, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,232
Int. Cl.³ G21C *3/34*
U.S. Cl. 376—462 **3 Claims**



1. A grid and sleeve assembly comprising:

(a) means defining a grid including a first pair of spaced, parallel grid straps extending substantially perpendicularly to a second pair of spaced parallel grid straps, the straps of each pair having the same spacing as the straps of the other pair and thereby defining at least one cell, the straps having generally straight upper edges lying substantially in a common plane;

(b) said straps each having a rectangular notch in a said strap edge thereof located centrally along said strap edge between the straps perpendicular thereto, said notch having a generally straight edge substantially parallel to said strap edge and having a pair of edges substantially perpendicular to said strap edge; and

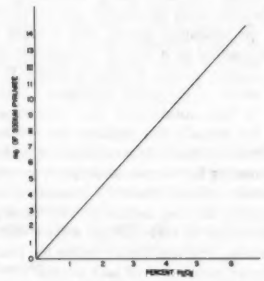
(c) a cylindrical sleeve having a solid circumferential wall of generally constant inside and outside diameters, said sleeve also having a lower annular end face seated upon said edges of said notches and engaging with an interference fit each of said pairs of edges of said notches of said four straps, with said sleeves welded to a plurality of said straps at said notches.

4,521,375

STERILIZING TREATMENT WITH HYDROGEN PEROXIDE AND NEUTRALIZATION OF RESIDUAL AMOUNTS THEREOF

Robert D. Houlsby, Sunnyvale, Calif., assignor to CooperVision, Inc., Menlo Park, Calif.

Filed Nov. 23, 1982, Ser. No. 444,045
Int. Cl.³ A61L *2/18*
U.S. Cl. 422—29 **25 Claims**



1. A method for sterilizing surfaces which come into contact with living tissue comprising

(a) contacting said surface with an aqueous medium containing a sterilizing amount of hydrogen peroxide, and

(b) subsequently contacting said surface with an amount of pyruvic acid or a water-soluble salt thereof effective to destroy any residual hydrogen peroxide.

19. A sterilization kit for articles which come into contact with living tissue comprising

(a) a container containing a sufficient amount of a hydrogen peroxide-yielding compound effective, when dissolved in a selected volume of water whereby a sterilizing solution is produced, to sterilize a treated article, and

(b) a container containing a sufficient amount of a water-soluble pyruvic acid salt effective to prepare an aqueous solution containing from about 5 to about 50 mg/ml of said salt, and

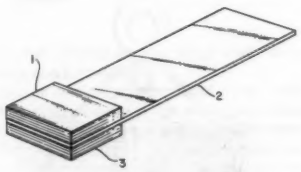
(c) means for holding said containers substantially immobile in said kit.

4,521,376

GLUTARALDEHYDE INDICATOR

Robert J. Witonsky, Princeton, and Raymond P. Larsson, Denville, both of N.J., assignors to Info-Chem Inc., Fairfield, N.J.

Filed Jun. 13, 1983, Ser. No. 503,892
Int. Cl.³ G01N *31/22, 33/52*
U.S. Cl. 422—56 **30 Claims**



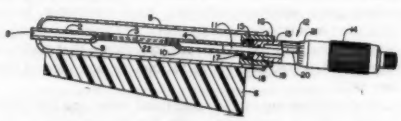
1. An indicator capable of distinguishing between glutaraldehyde sterilant solutions of different glutaraldehyde concentrations, comprising an absorbant medium which has been impregnated with a solution of a sulfite compound and amine compound wherein the amine compound is (1) an amino acid where the amino acid is glycine or lysine; or (2) an ammonium compound and wherein said sulfite and amine compounds are present in an amount effective to distinguish between glutaraldehyde solutions of different glutaraldehyde concentrations.

4,521,377

FLOW THROUGH GAS ANALYZER

John J. Kozacik, 1116 Carney St., Cincinnati, Ohio 45239

Filed Feb. 25, 1982, Ser. No. 352,213
Int. Cl.³ G01N *7/00*
U.S. Cl. 422—92 **10 Claims**



1. A micro fluid analyzer consisting of an elongated transparent analyzer tube having an outer reservoir with an open outer end, a linear capillary tube connected at one end to the inner end of said outer reservoir, and an inner reservoir connected at its inner end to the opposite end of said capillary tube, said reservoirs and said capillary tube lying in tandem relation to each other, displacement means operatively connected to the outer end of said inner reservoir for drawing a carrier fluid placed in the outer reservoir through said capillary tube into the inner reservoir, means for measuring the

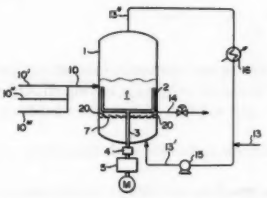
volume of fluid drawn into the inner reservoir, and reference means in association with said capillary tube for determining the extent of a sample bubble of a fluid to be analyzed which is injected into the carrier fluid in the outer reservoir and drawn through the capillary tube as a concomitant of drawing the carrier fluid into said inner reservoir.

4,521,378

FLUID BED REACTOR SYSTEM COMPOSED OF CYLINDRICAL REACTION VESSEL EQUIPPED WITH DISTRIBUTION PLATE AND AGITATOR

Mitsunori Ichimura; Ryoichi Yamamoto, both of Ichihara, and Katsutoshi Horimoto, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Mar. 9, 1983, Ser. No. 473,433
Claims priority, application Japan, Mar. 9, 1982, 57-37830
Int. Cl.³ B01J *8/38, 8/44*
U.S. Cl. 422—135 **3 Claims**



1. A fluid bed reactor system in which an olefin monomer or monomers can be catalytically polymerized in a fluid bed under fluidized conditions and comprising a cylindrical reaction vessel, a distribution plate provided in the lower section of the vessel, an agitator disposed in a fluidized bed above the plate and adapted to cause a rotational flow in the fluidized bed, a fluidizing gas medium supply line means provided below the plate and adapted to cause said fluidized conditions, a catalyst introducing line means adapted to supply a catalyst to the fluidized bed, a fluidizing gas medium recycle line means provided above the fluidized bed in the reaction vessel and adapted to recycle the gas medium to the gas medium supply line means, and a polymer product recovering line means adapted to recover the polymer product from the fluidized bed; characterized in that the distribution plate satisfies the following conditions,

(i) each of a plurality of passage holes provided in the distribution plate for passage of the fluidizing gas medium is covered with a cap having an opening,

(ii) the opening in said cap is provided only on one side of the cap, and the direction (A) of the opening is not opposite to the direction (B) of the rotational flow,

(iii) the direction (A) of the opening varies with the distance (d) from the center (X) of the plate to the center (Y) of the hole,

(iv) the opening direction (A) of the cap or caps at a hole or holes which are located closest to said center of said plate is nearer to the center (X) than is the tangential direction of a circle having the center (X) as a center and the distance ($d_{min.}$) to the hole or holes as a radius,

(v) the opening direction (A) of a cap or caps at a hole or holes which are located furthest from said center of said plate is directed farther from the center (X) than is the tangential direction of a circle having the center (X) as a center and the distance ($d_{max.}$) to the hole or holes as a radius, and

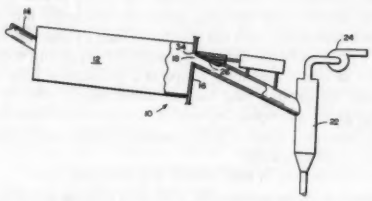
(vi) the opening direction (A) of caps at holes other than the hole or holes specified in (iv) and (v) are displaced from the direction specified in (iv) to the direction specified in (v) according to the distance (d) to these holes.

4,521,379

ROTARY CALCINING SYSTEM WITH CLEANING MEANS

Bennie J. Beane, Wilmington, N.C., assignor to General Electric Company, San Jose, Calif.

Filed Jun. 24, 1983, Ser. No. 507,561
Int. Cl.³ B01J *6/00, 8/08*
U.S. Cl. 422—209 **19 Claims**



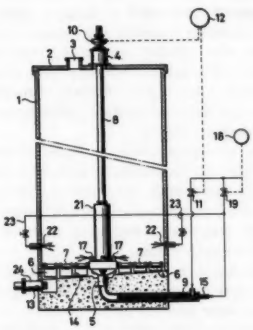
1. An improved rotary calcining system for calcining materials of a tacky consistency having a propensity for adhering, comprising the combination of a rotary cylinder calciner having a fed inlet in an upstream end and an outlet port in a downstream end wall of the cylinder calciner connected with a discharge duct leading therefrom for carrying material from the cylinder calciner, said combination being provided with a reciprocable cleaning plate located within said discharge duct adjacent to the downstream end wall of the cylinder calciner and the outlet port therein and arranged to reciprocally move forward into and backward out from the outlet port and thereby free said port of any adhering material.

4,521,380

APPARATUS FOR DILUTION OF PULP

Shigeo Fujimoto, 3984-24 Imaizumi, Fuji-shi, Shizuoka-ken, Japan

Filed Apr. 26, 1983, Ser. No. 489,411
Claims priority, application Japan, May 7, 1982, 57-75494
Int. Cl.³ B01F *7/20, 15/04;* **D21C** *7/12;* **G05D** *7/06*
U.S. Cl. 422—273 **17 Claims**



1. In a pulp diluting apparatus having a cylindrical vessel, a lid having a pulp inlet therein covering the top of said vessel, a bottom end portion of said cylindrical vessel, an upper bearing mounted on the center of said lid, a lower steady support bearing mounted on the center of said bottom end portion of said cylindrical vessel, a rotary shaft rotatably mounted between said upper bearing and said lower bearing, rods having scraper blades mounted on the lower portion of said rotary shaft, a driving machine connected to said rotary shaft for rotating said shaft, and an outlet in the lower part of said cylindrical vessel beneath said rods for taking the diluted pulp out of said cylindrical vessel, the improvement comprising:

water dischargers mounted on said rotary shaft in the center of said cylindrical vessel at a position above said rods and in positions spaced circumferentially around said rotary shaft and each having a water outlet disposed at a level above said rods and opening radially into the interior of said cylindrical vessel, and a first water supply pipe connected to said water dischargers;

a second water supply pipe disposed at the bottom portion of said cylindrical vessel proximate the center of said bottom end portion and opening generally upwardly into fluid communication with the interior of said cylindrical vessel at a position below said rods, means for supplying water to said second water supply pipe at a pressure at least sufficient for causing said second water supply pipe to discharge an ascending current of water sufficiently strong for pushing a mass of pulp contained within said cylindrical vessel upwardly;

a valve provided in said second water supply pipe;

a torque detector connected with said driving machine for detecting the torque of said driving machine and connected to said valve for operating said valve in response to an increase in torque detected to control the pressure of water supplied to said cylindrical vessel through said second water supply pipe to discharge an ascending current of water capable of pushing the lower portion of the mass of pulp upwardly at least to the position of said water outlets of said water dischargers.

4,521,381

RECOVERY OF RHENIUM

Alan D. Douglas, and Kenneth T. Reilly, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 7, 1984, Ser. No. 669,126

Int. Cl.³ C01G *47/00*

U.S. Cl. 423—49 **4 Claims**

1. A process for recovering rhenium from tungsten and rhenium bearing material, said process comprising:

(a) reacting said tungsten and rhenium bearing material with a mixture of sodium hydroxide and an oxidizing reactant to form a fused solid containing soluble tungsten and rhenium values.

(b) dissolving said fused solid in water to form an alkaline solution comprising tungsten and rhenium values

(c) contacting said solution comprising tungsten and rhenium values with a bed of a strongly basic anion exchange resin to adsorb a major portion of the rhenium values and form a rhenium depleted solution comprising substantially all of the tungsten values,

(d) contacting an organic stripping liquid comprising tributyl phosphate and hydrochloric acid with said anion exchange resin containing the rhenium values to form a liquid organic containing the rhenium values,

(e) contacting water with said resin to form an aqueous solution of rhenium values,

(f) mixing said liquid organic and aqueous solution to form a two phase system consisting of a first organic phase of tributylphosphate and the major portion of the rhenium values and an aqueous phase of hydrochloric acid, water, and the minor portion of the rhenium.

(g) separating said organic phase from said aqueous phase,

(h) removing the major portion of the hydrochloric acid from said aqueous phase to form a solution of perrhenic acid,

(i) mixing said organic phase with aqueous ammonia to transfer essentially all of the rhenium values from said organic phase and to form another two phase system consisting of another organic phase another aqueous phase consisting of essentially all of the rhenium and,

(l) separating said second aqueous phase from said second organic phase.

4,521,382

FORMATION OF COKE FROM HEAVY CRUDE OILS IN THE PRESENCE OF CALCIUM CARBONATE

Michael A. Kessick; Zacharia M. George, and Linda G. Schneider, all of Edmonton, Canada, assignors to Alberta Research Council, Edmonton, Canada

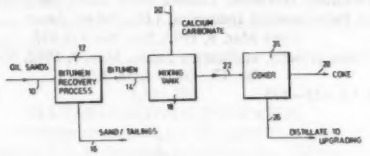
Filed Jun. 9, 1980, Ser. No. 157,938

Claims priority, application United Kingdom, Jun. 8, 1979, 7920001

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.³ C01G *31/00*

U.S. Cl. 423—68 **1 Claim**



1. A process for the recovery of nickel and vanadium values from heavy crude oil or residua having an API gravity of less than 25° C. and sulphur, nickel and vanadium, which comprises:

mixing calcium carbonate with said heavy crude oil or residua,

coking the resulting mixture at a temperature of about 400° to about 500° C. to produce a coke,

combusting said coke to form an ash,

leaching said ash with hydrochloric acid to dissolve nickel and vanadium values therefrom, and

recovering said nickel and vanadium values from the leach liquor.

4,521,383

LIME ADDITION TO HEAVY CRUDE OILS PRIOR TO COKING

Michael A. Kessick; Zacharia M. George, and Linda G. Schneider, all of Edmonton, Canada, assignors to Alberta Research Council, Edmonton, Canada

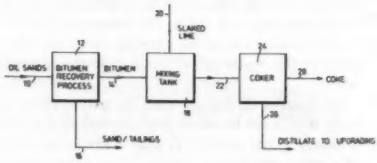
Filed Jun. 9, 1980, Ser. No. 157,939

Claims priority, application United Kingdom, Jun. 8, 1979, 7920001

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.³ C01G *31/00*

U.S. Cl. 423—68 **1 Claim**



1. A process for the recovery of nickel and vanadium values from a heavy oil or residua having an API gravity value of less than 25° and containing nickel, vanadium and sulphur, which comprises:

(a) mixing a calcium compound selected from the group consisting of calcium hydroxide and calcium oxide with said heavy crude oil or residua prior to coking in an amount sufficient to give a molar ratio of calcium to sulphur in the heavy crude oil or residua of about 1:3 to about 1:1;

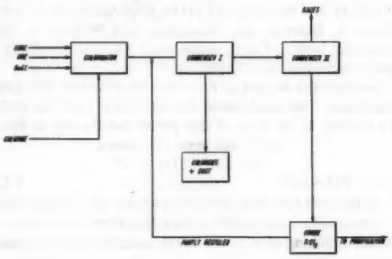
(b) effecting coking of said heavy crude oil at a temperature of about 450° C. to about 500° C. to produce a coke;
(c) combusting said coke to produce an ash;
(d) leaching said ash with hydrochloric acid to dissolve nickel and vanadium values therefrom, and
(e) recovering said nickel and vanadium values from the leach liquor.

4,521,384

PROCESS FOR THE PRODUCTION OF NEARLY ALUMINIUM CHLORIDE-FREE TITANIUM TETRACHLORIDE FROM TITANIFEROUS RAW MATERIALS CONTAINING ALUMINUM COMPOUNDS

Achim Hartmann, Pulheim, and Hans Thumm, Leverkusen, both of Fed. Rep. of Germany, assignors to Kronos Titan - G.m.b.H., Leverkusen, Fed. Rep. of Germany

Filed Sep. 9, 1982, Ser. No. 416,262
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136289
Int. Cl.³ C22B *1/08*
U.S. Cl. 423—72 **8 Claims**



1. A process for the production of a nearly aluminum chloride-free titanium tetrachloride comprising:
(a) chlorinating in a fluidized bed and in the presence of a reducing agent a finely divided titaniferous raw material which is rich in titanium and which contains impurities including aluminum compounds to form a gaseous reaction mixture containing titanium tetrachloride, aluminum chloride and other impurities;
(b) reacting the aluminum chloide with sodium chloride to form a complex;
(c) subsequent to step (b), subjecting the gaseous reaction mixture containing titanium tetrachloride, aluminum chloride/sodium chloride complex and impurities to a first condensing step whereby aluminum chloride/sodium chloride complex and lower volatility impurities are condensed;
(d) separating the condensate of step (c) from the gaseous reaction mixture;
(e) subjecting the gaseous reaction mixture to a second condensing step whereby the titanium tetrachloride is condensed; and
(f) recovering titanium tetrachloride which contains not more than 0.07% by weight aluminum chloride.

4,521,385

RECOVERY OF TITANIUM VALUES

Hans G. Brandstatter, Welland, Canada, assignor to Ontario Research Foundation, Sheridan Park, Canada

Filed Feb. 28, 1983, Ser. No. 470,070
Claims priority, application United Kingdom, Mar. 2, 1982, 8206846
Int. Cl.³ C01G *23/02*
U.S. Cl. 423—76 **6 Claims**

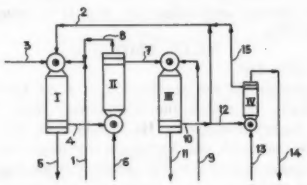
1. A method for the separate recovery of iron and titanium values in substantially pure form from an iron- and titanium-containing ore or ore concentrate wherein the iron and titanium values are in oxide, carbonate and/or hydroxide form and which also contains gangue constituents comprising at least one oxide selected from the group consisting of silica, alumina, magnesia and lime, which comprises:
blending said iron- and titanium-containing ore or ore concentrate in finely divided form with finely divided carbon in at least a stoichiometric amount to convert said titanium to titanium carbide and said iron to carburized iron containing no more than about 4 wt.% of carbon,
heating said blend in a reaction zone to a temperature of about 1200° to about 2300° C. to initiate and sustain a single step solid-state reducing and carburization reaction to convert substantially all the titanium values to titanium carbide and substantially all the iron values to carburized iron containing no more than 4 wt.% carbon while said gangue constituents remain relatively unaffected, whereby said titanium carbide and carburized iron are obtained in a single treatment step from the ore or concentrate by a solid state reaction,
subjecting said heated blend to magnetic separation to separate a magnetic fraction comprising at least a substantial proportion of the iron values in the form of carburized iron from a non-magnetic fraction comprising at least a substantial proportion of the titanium values in the form of titanium carbide and said relatively unaffected gangue constituents, and
chlorinating said non-magnetic fraction to selectively form titanium tetrachloride from said titanium carbide while leaving substantially unaffected said gangue constituents, thereby achieving separation of the titanium values in substantially pure form.

4,521,386

PROCEDURE FOR OBTAINING HIGH PURITY MAGNESIUM SALTS OR THEIR CONCENTRATE SOLUTIONS FROM SEA WATER, BRINE OR IMPURE MAGNESIUM SALT SOLUTIONS

Gustavo D. Nogueira, Daoiz y Velarde 7, Alcala de Henares (Madrid); Jose M. R. Vega, San Ernesto 12, and Eduardo D. Nogueira, Avda. Mediterraneo 47, both of Madrid, all of Spain

Filed Nov. 2, 1983, Ser. No. 547,769
Claims priority, application Spain, Nov. 5, 1982, 517149
Int. Cl.³ C01F *5/00, 1/00*
U.S. Cl. 423—157 **15 Claims**



1. Process for obtaining high purity magnesium salts or concentrate solutions from a liquid, raw material such as sea water, brine water or impure magnesium salt solutions, consisting in:
a treatment stage of the liquid, raw material by chloration and filtration;
followed by an extraction stage of magnesium from the liquid treated in the treatment stage, by placing same in contact with an organic solution containing an extraction agent belonging to a phosphor based organic acid group, the magnesium being exchanged by hydrogen ions which are neutralized by an addition of an alkali, until a required pH is reached, thus producing:

an organic extract containing the magnesium and some impurities,

as well as a first aqueous solution with low magnesium content;

followed by a washing stage where the magnesium organic extract is put into contact with a second aqueous solution having a concentration of magnesium, in order to exchange a co-extracted calcium fraction from the organic extract by the magnesium from the second aqueous solution thus producing:

a washed organic extract which contains the magnesium but no calcium,

and a third aqueous solution which is then incorporated to the extraction stage;

followed by a magnesium re-extraction stage where the washed organic magnesium extract comes into contact with a pure acid or with a solution of the acid with the salt corresponding to the magnesium, at controlled pH, producing:

an organic refined product practically free from magnesium but which contains a small amount of heavy metal,

and a concentrate aqueous solution with high purity magnesium salt corresponding to anion of the acid used;

followed by a regeneration stage where a fraction of the organic refined product comes into contact with a concentrate acid producing:

a discharged organic solution which together with the non-regenerated fraction of the organic refined product are recycled in the extraction stage,

and acid aqueous solution containing the heavy metals; and

a crystallization stage of the concentrate magnesium solution by evaporating excess water, or by common ion effect with an addition of acid, to obtain:

a crystalline pure magnesium salt,

and mother liquors which are recycled in the re-extraction stage.

4,521,387

PURIFICATION OF GASES CONTAINING CO AND/OR CO_2

Franz J. Broecker, Ludwigshafen; Hans Gettert, Gross-Sachsen, and Knut Kaempfer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 18, 1983, Ser. No. 552,930

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243206

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—210 **3 Claims**

1. A process for the purification of a gas containing CO and/or CO_2, in which the compounds H_2S, COS, CS_2, CH_3SH, higher mercaptans, HCN, CHOOH, HCL, Fe Carbonyls, Ni carbonyls and Vanadium carbonyls and unreacted oxygen, said compounds being contained in gases produced by the partial oxidation of fossil fuels, as well as mercury which is present in the hydrogen produced in the electrolysis of alkali metal chlorides are removed by catalytic reaction at elevated temperatures, wherein the gas to be purified is passed directly through a catalyst charge containing a Cu/ZnO catalyst which is prepared by the thermal decomposition of a catalyst precursor of the formula

$$Cu_xZn_y(OH)_6(CO_3)_2,$$

where $x+y=5$ and x and y are integers or non-integral numbers in the ranges

$x=1.0–2.5$

$y=2.5–4.0$

and the space velocity is set at 500–5,000 m^3 (S.T.P.) per m^3 of catalyst per hour.

4,521,388

NO_x REDUCTION IN FLUE GAS

Norman C. Samish, Houston, Tex., and Jack B. Pohlenz, Arlington Heights, Ill., assignors to Shell California Production Inc., Houston, Tex.

Filed Mar. 27, 1984, Ser. No. 594,010

Int. Cl.³ C01B *21/00;* **B01J** *8/00*

U.S. Cl. 423—235 **3 Claims**

1. A process using NH_3 for reducing the NO_x in a waste gas to a desired level of NO_x while limiting the NH_3 in the treated waste gas to less than 10 parts per million, said process comprising:

splitting the waste gas into two separate streams;

treating one of the streams with an equal mole ratio of NH_3 to NO_x, giving a higher NH_3/NO_x ratio, resulting in a substantial increase in NO_x reduction; and

recombining said two streams to produce a single stream having the desired concentration level of NO_x and NH_3.

4,521,389

PROCESS OF CONTROLLING NO_x IN FCC FLUE GAS IN WHICH AN SO_2 OXIDATION PROMOTOR IS USED

William A. Blanton, Jr., Woodacre, and William L. Dimpel, Oakland, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 308,689, Oct. 10, 1981, abandoned. This application Jan. 31, 1983, Ser. No. 462,171

The portion of the term of this patent subsequent to Feb. 28, 2001, has been disclaimed.

Int. Cl.³ C01B *21/00*

U.S. Cl. 423—235 **8 Claims**

1. A process for controlling the oxides of nitrogen in a flue gas, containing said oxides, from the regenerator of a fluid catalytic cracking unit in which the sulfur oxides formed in the regenerator are controlled by means of a circulating sulfur oxide sorbent used in combination with a sulfur dioxide oxidation promoter, said process comprising:

(a) mixing the flue gas at a temperature between about 500° F. and about 1600° F. with a sufficient amount of ammonia or an ammonia-generating compound to provide at least a stoichiometric amount of ammonia relative to the degree of nitrogen oxide control desired; and

(b) passing the mixture of flue gas and ammonia through an oxygen-rich combustion zone having a temperature in the range of from about 1200° F. to about 2000° F. for a time sufficient to significantly lower the amount of nitrogen oxides present in the effluent from the combustion zone relative to that present in the flue gas.

4,521,390

CONTINUOUS PROCESS AND EQUIPMENT FOR THE RECOVERY OF NITROGEN OXIDES FROM NITROUS GASES

Bernhard Mouillé , Pievefitte, and Michel Durand, Angeles Gazon, both of France, assignors to Compagnie Francaise de l'Azote Cofaz, Paris, France

Continuation of Ser. No. 158,142, Jun. 10, 1980, abandoned. This application Oct. 13, 1982, Ser. No. 434,104

Claims priority, application France, Jun. 13, 1979, 79 15147

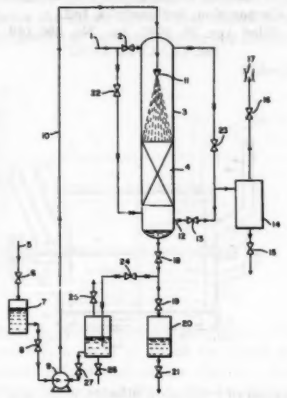
Int. Cl.³ C01B *21/40*

U.S. Cl. 423—239 **11 Claims**

1. A process for the continuous recovery of nitrogen oxides from atmospheric off-gases called nitrous gases containing between about 500 to 5000 vpm nitrogen oxides which comprises the steps of:

(a) simultaneously passing said gas and water over activated carbon adsorbent in a co-current, countercurrent or cross-flow relationship at a gas spatial velocity between about 100 to $3500h^{-1}$ and a liquid spatial velocity between about 0.05 to $2h^{-1}$ and under conditions of pressure between

about 0.9 to 12 bars (abs) and temperature between about 2° to 80° C.;



(b) recovering a colorless gaseous effluent having reduced nitrogen oxide content; and

(c) recovering the aqueous nitric acid solution.

4,521,391

METHOD TO IMPROVE YIELDS OF SODIUM HYPOPHOSPHITE

William E. Estes, Ossining, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 13, 1984, Ser. No. 570,477

Int. Cl.³ C01B *15/16, 25/26*

U.S. Cl. 423—307 **2 Claims**

1. A process for increasing the yield of sodium hypophosphite produced by the reaction of phosphorus, sodium hydroxide, water and calcium hydroxide, comprising increasing the H_2O/P_4 molar ratio to within the range of about 38 to about 60.

4,521,392

PROCESS FOR BLENDING PHOSPHORIC ACIDS OF DIFFERING IMPURITY CONTENT

Harold E. Mills; David L. Murdock, both of Lake City; Richard M. Ramer, Gainesville, and Francis M. Sale, Lake City, all of Fla., assignors to Occidental Chemical Agricultural Products, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 215,885, Dec. 5, 1980, Pat. No. 4,376,756. This application Mar. 14, 1983, Ser. No. 475,275

The portion of the term of this patent subsequent to Mar. 15, 2000, has been disclaimed.

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—317 **33 Claims**

1. Process for producing a blended phosphoric acid having an R-value no greater than about 0.86, where the R-value is one hundred times the ratio of the MgO analysis by weight divided by the P_2O_5 analysis by weight of said acid, said process comprising blending a sufficient amount of at least one purified dihydrate process phosphoric acid having an R-value less than about 0.86 with at least one dihydrate process phosphoric acid having an R-value greater than about 0.86 to produce a blended phosphoric acid having an R-value no greater than about 0.86, wherein said purified dihydrate process phosphoric acid is purified by aging a dihydrate process phosphoric acid for sufficient time to allow an effective amount of solid magnesium-containing impurities to precipitate therefrom and thereby forming said purified dihydrate process phosphoric acid having an R-value no greater than about 0.86 for blending with said dihydrate process phosphoric acid having an R-value greater than about 0.86.

4,521,393

METHOD OF MANUFACTURING β TYPE SILICON NITRIDE WHISKERS

Hajime Saito, 1088-193, Aza-Hirago, Ohaza-Fujieda, Nisshin-Cho, Aichi-Gun, Aichi Pref., and Tetsuro Urakawa, Kariya, both of Japan, assignors to Toshiba Ceramics Co. Limited, Tokyo and Hajime Saito, Aichi, both of, Japan

Filed Jun. 26, 1984, Ser. No. 624,702

Claims priority, application Japan, Apr. 18, 1984, 59-76450

Int. Cl.³ C01B *21/068*

U.S. Cl. 423—344 **9 Claims**

1. A method of manufacturing β type silicon nitride whiskers, which comprises preparing a mixture of silica, carbon, and cryolite in a molar ratio of $1:(2\sim10):(1/12\sim\frac{1}{4})$, reacting said mixture in a mixed gas atmosphere of N_2 and NH_3 obtained by adding NH_3 to N_2, in a molar ratio of not higher than 1/5 based on N_2 by heating the mixture at a temperature of 1,250°–1,450° C., said NH_3 being present in an amount sufficient to effect a higher content of β type silicon nitride than that produced by said method in the absence of NH_3.

4,521,394

CONVERSION OF GASES TO USEABLE PRODUCTS

Hassan Windawi, Arlington Heights; Gene R. Grieger, Rolling Meadows, and Warren R. Oakdale, Morton Grove, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 498,624, May 27, 1983, abandoned. This application Mar. 21, 1984, Ser. No. 592,048

Int. Cl.³ C01C *1/04*

U.S. Cl. 423—363 **7 Claims**

1. A process for the conversion of hydrogen and nitrogen to ammonia which comprises reacting said hydrogen and nitrogen at reaction conditions which include a temperature in the range of from about 500° C. to about 700° C. and a pressure in the range of from about 100 to about 1000 atmospheres in the presence of a catalyst comprising an iron-containing compound admixed with elemental copper and aluminum-, potassium- and vanadium-containing compounds to form and recover said ammonia.

4,521,395

PROCESS FOR OXIDATION AND AMMOXIDATION

Thomas C. Kuechler, Maryland Heights; Jerry R. Ebner, St. Charles, and Tao P. Li, Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 18, 1983, Ser. No. 553,203

Int. Cl.³ C01C *1/02*

U.S. Cl. 423—376 **6 Claims**

1. A process for the ammoxidation of methanol to hydrogen cyanide comprising feeding to an ammoxidation reactor operated at ammoxidation reaction conditions including a temperature of 200° to 600° C. a feed comprising methanol, ammonia, and oxygen and wherein said ammoxidation reactor contains a fluidized bed of ammoxidation catalyst consisting essentially of B_aPO_x wherein a is 0.8 to 1.25 and x is the total number of the oxygen atoms in the oxides of the other atoms, and hydrogen cyanide in high yields is produced in the ammoxidation reactor as a product of the process.

4,521,396

Patent Not Issued For This Number

4,521,397

PROCESS FOR PRODUCING CALCIUM HYPOCHLORITE HYDRATE CRYSTALS

Keiichi Nakaya, Chiba, and Kunio Sato, Ichihara, both of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Jul. 20, 1983, Ser. No. 515,547

Claims priority, application Japan, Aug. 4, 1982, 57-135133

Int. Cl.[3] C01B *11/04*

U.S. Cl. 423—474 10 Claims

1. A process for producing calcium hypochlorite hydrate crystals, which comprises continuously supplying basic calcium hypochlorite slurry and chlorine gas to a reactor, and reacting them at a temperature of from 20° to 50° C. under a condition that a chlorination rate is maintained from 92 to 98.5% and a crystallization velocity of calcium hypochlorite hydrate crystals in the reactor is controlled to be not greater than 200 $kg/m^3.hr$.

4,521,398

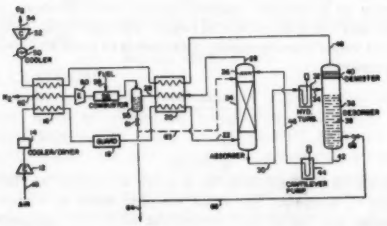
CONTROLLED TEMPERATURE EXPANSION IN OXYGEN PRODUCTION BY MOLTEN ALKALI METAL SALTS

Donald C. Erickson, Annapolis, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 18, 1983, Ser. No. 514,742

Int. Cl.[3] C01B *13/02*

U.S. Cl. 423—579 12 Claims



1. In a continuous process for producing oxygen by the repeated steps of contacting a feed air stream with a molten solution of alkali metal nitrate and nitrite oxygen acceptor which becomes oxidized, separately releasing the oxygen from the oxidized oxygen acceptor so as to regenerate the oxygen acceptor and generate product oxygen, recycling the regenerated oxygen acceptor and removing an oxygen-depleted gas stream, the improvement comprising reducing the temperature of the oxygen-depleted gas stream by heat exchange with the feed air stream, condensing residual entrained oxygen acceptor from the oxygen-depleted gas stream, combusting of said gas stream with a fuel to elevate its temperature and expanding the gas stream through a turbine to recover power.

4,521,399

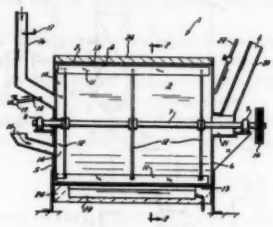
METHOD AND APPARATUS FOR THE PRODUCTION OF LEAD OXIDE

Benjamin F. McKinney, Indianapolis, Ind., assignor to Oxide & Chemical Corporation, Indianapolis, Ind.

Filed Apr. 29, 1983, Ser. No. 490,149

Int. Cl.[3] C01G *21/02*

U.S. Cl. 423—620 5 Claims



1. The method of producing litharge with varying free lead content in a horizontal cylindrical reactor having inlet means for the supply of lead, air and water, an outlet for the removal of litharge, a pair of horizontally disposed blades rotatable within the reactor and about the axis thereof, and means for driving the blades to break the supply of lead into fine particles and disperse the lead within the reactor, said method comprising the steps of:

a. preheating the reactor;

b. supplying lead to the inlet means for introduction into the reactor;

c. creating a flow of air through the reactor to oxidize the lead particles and transport the litharge to the outlet;

d. utilizing substantially the entire blade edge-reactor interface to provide a uniform oxidation and attrition zone over the full length and interior surface of the reactor; and,

e. controlling the rotational speed of the blades to maintain the incompletely oxidized particles within the oxidation and attrition zone and to effect centrifugal classification of the litharge within the reactor for transport to the outlet.

4,521,400

AGITATOR APPARATUS

Thomas D. Hodgson, Abingdon, and William R. Foot, Poole, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Sep. 27, 1982, Ser. No. 424,250

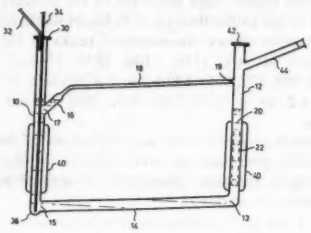
Claims priority, application United Kingdom, Sep. 29, 1981, 8129387

Int. Cl.[3] B01F *11/00*

U.S. Cl. 423—658.5 10 Claims

1. An apparatus for oscillating, agitating and circulating a liquid dissolvent for dissolving a solid object, the apparatus comprising, a vessel for containing a liquid dissolvent for the solid object and comprising two upwardly extending chambers and two vertically displaced ducts each connected between respective ports in the two chambers, the upper duct comprising a first portion extending acclivitously from the upper duct port in one said chamber and a second portion of smaller

diameter than the first portion extending from the first portion to the upper duct port in the other chamber, means to support the solid object within the liquid, and means for applying a greater gas pressure above the liquid in said one chamber than is applied above the liquid in the other chamber whereby in operation the surface of the liquid in the one chamber initially



above the upper duct port thereof is oscillated by the effect of the gas pressure in a cycle in which the liquid surface falls below the upper duct port and said gas above the liquid surface escapes through the upper duct, and the liquid surface subsequently rises above the upper duct port to complete the cycle, such that the liquid dissolvent oscillates over the solid object.

4,521,401

CONSTANT RELEASE RATE SOLID ORAL DOSAGE FORMULATIONS OF QUINIDINE

James M. Dunn, Littleton, Colo., assignor to Verex Laboratories, Inc., Englewood, Colo.

Division of Ser. No. 455,192, Jan. 3, 1983,. This application Feb. 16, 1984, Ser. No. 580,933

Int. Cl.³ A61K *9/22, 9/26*

U.S. Cl. 424—19 **8 Claims**

1. A constant order release solid oral dosage formulation of quinidine or a pharmaceutically acceptable salt thereof, said formulation comprising: a therapeutically effective amount of quinidine or a pharmaceutically acceptable salt thereof; from about 0.5 to 6.0 weight percent of one or more cellulose derivatives selected from the group consisting of cellulose acetate phthalate, hydroxypropylmethylcellulose, ethyl cellulose, and microcrystalline cellulose; from about 2.5 to 35 weight percent of a hydrogenated vegetable oil; from about 1 to 20 weight percent of carboxypolymethylene; from about 0.5 to 4.0 weight percent of fumed silicon dioxide and from about 0.4 to 3.0 weight percent of a tabletting lubricant.

4,521,402

CONSTANT RELEASE RATE SOLID ORAL DOSAGE FORMULATIONS OF HYDRAZINE

James M. Dunn, Littleton, Colo., assignor to Verex Laboratories, Inc., Englewood, Colo.

Division of Ser. No. 455,192, Jan. 3, 1983,. This application Feb. 17, 1984, Ser. No. 581,368

Int. Cl.³ A61K *9/22, 9/26*

U.S. Cl. 424—19 **8 Claims**

1. A constant order release solid oral dosage formulation of hydralazine or a pharmaceutically acceptable salt thereof, said formulation comprising: a therapeutically effective amount of hydralazine or a phramaceutically acceptable salt thereof; from about 0.5 to 6.0 weight percent of one or more cellulose derivatives selected from the group consisting of cellulose acetate phthalate, hydroxypropylmethylcellulose, phthalate ethyl cellulose, and microcrystalline cellulose; from about 2.5 to 35 weight percent of a hydrogenated vegetable oil; from about 1 to 20 weight percent of carboxypolymethylene; from about 0.5 to 4.0 weight percent of fumed silicon dioxide and from about 0.4 to 3.0 weight percent of a tabletting lubricant.

4,521,403

CHEMOTHERAPEUTIC METHOD FOR TREATING PERIODONTAL DISEASE

Gilbert I. Simon, 1111 Midland Ave., Bronxville, N.Y. 10708, and Roy T. Witkin, 23 Broadview Rd., Westport, Conn. 06880

Continuation-in-part of Ser. No. 459,525, Jan. 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 145,590, May 1, 1980, abandoned. This application Dec. 30, 1983, Ser. No. 565,661

Int. Cl.³ A61K *7/20, 31/79, 33/18, 31/755*

U.S. Cl. 424—51 **6 Claims**

1. A method of controlling *Actinomyces viscosus, Bacteroides intermedius and Bacteroides gingivalis* microorganisms implicated in diseases of the periodontium which comprises applying two "swishes" of an oral lavage to the periodontium for a period of time totalling 20–40 seconds, and sufficient to thoroughly wet the tissues of the gum, expectorating each, and thereby to destroy or inactivate the microorganisms, each "swish" being an oral lavage in the form of an aqueous solution containing from about 0.5 to about 10.0% by weight of hydrogen peroxide and from about 0.05 to about 2.0% by weight of iodine derived from a povidone-iodine complex by the hydrogen peroxide.

4,521,404

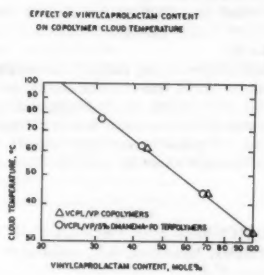
POLYMERIC HAIR PREPARATION

Donald H. Lorenz, Basking Ridge; Edward J. Murphy, Wayne, and John M. Rutherford, Jr., Kinnelon, all of N.J., assignors to GAF Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 292,329, Aug. 13, 1981, abandoned. This application Nov. 10, 1982, Ser. No. 440,648

Int. Cl.³ A61K *7/09;* **A45D** *7/00;* **C08F** *226/10*

U.S. Cl. 424—71 **10 Claims**


EFFECT OF VINYLCAPROLACTAM CONTENT ON COPOLYMER CLOUD TEMPERATURE
CLOUD TEMPERATURE, °C
VINYLCAPROLACTAM CONTENT, MOLE%
△ VCPL/VP COPOLYMERS
○ VCPL/VP/DIMAPMAH-PO TERPOLYMERS

1. In a hair conditioning composition containing a polymer, said polymer derived from polymerization of vinyl pyrrolidone and an ammonium derivative monomer having from 6 to 12 carbon atoms selected from the group consisting of dialkylaminoalkyl methacrylamide, dialkyl dialkenyl ammonium halide and a dialkylamino alkyl methacrylate or acrylate, wherein the improvement comprises incorporating therein a substantially major amount, based on said monomers, of N-vinyl-ε-caprolactam monomer to provide a hair conditioning agent having a number average molecular weight between about 20,000 and about 700,000.

3. A hair conditioning polymer comprising between about 17–32 weight % N-vinyl pyrrolidone, between about 65–80 weight % N-vinyl-ε-caprolactam, between about 3–6 weight % of an ammonium derivative monomer having from 6 to 12 carbon atoms, selected from the group consisting of dialkyl aminoalkyl methacrylamide, dialkyl dialkenyl ammonium halide and a dialkylamino alkyl methacrylate or acrylate and between about 0–5 weight % stearyl methacrylate.

4,521,405

METHODS AND MATERIALS FOR TREATMENT OF DISEASE STATES INVOLVING IMMUNOLOGICAL FACTORS

John McMichael, P.O. Box 81, Cambridge Springs, Pa. 16403, assignor to John McMichael, Cambridge Springs, Pa.

Filed May 17, 1982, Ser. No. 378,752
Int. Cl.[3] A61K *39/165*
U.S. Cl. 424—92 9 Claims

1. A method for alleviating the symptoms of a multiple sclerosis disease state comprising administering to the disease victim an effective amount of a composition comprising a mixture of histamine and inactivated, attenuated measles virus or an immunologically active fraction thereof.

4,521,406

ANTITUMOR AGENT

Yasuo Kawamura, Kyoto; Tadashi Nishiyama, Kadoma; Tomiyoshi Itoh, Suita, and Takuo Sakai, Sakai, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed May 20, 1981, Ser. No. 265,563
Claims priority, application Japan, May 22, 1980, 55-68300
Int. Cl.[3] A61K *37/48, 31/70, 31/505*
U.S. Cl. 424—94 5 Claims

1. An antitumor agent for use against solid tumors sensitive to 5-fluorousacil in humans comprising a combination of 5-fluorocytosine and cytosinedeaminase, said agent containing cytosindeaminase in an amount of 0.03 to 1.0 IU per milligram of 5-fluorocytosine whereby 5-fluorouracil is formed.

4,521,407

TREATMENT OF ACQUIRED IMMUNE DEFICIENCY SYNDROME WITH THYMUS EXTRACT

Russell W. Pelham, E. Weymouth; Charlotte S. Redden, Natick, both of Mass.; Aliza Eshkol, Tel-Hashomer, Israel, and Gerald E. Stiles, Duxbury, Mass., assignors to Serono Pharmaceutical Partners, Randolph, Mass.

Filed Aug. 29, 1983, Ser. No. 527,569
Int. Cl.[3] A61K *35/26*
U.S. Cl. 424—95 8 Claims

1. A method of stimulating the cellular immune system in a person having acquired immune deficiency syndrome by administering to such person an immunopotentiating effective amount of a calf thymus extract, which extract shows, upon electrophoresis on polyacrylamide gel at pH 8.6, two main characteristic bands with an Rf of about 0.25 and 0.44.

4,521,408

ANTIBIOTICS-859A AND PRODUCTION THEREOF

Edward O. Stapley, Metuchen, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 14, 1982, Ser. No. 368,339
Int. Cl.[3] A61K *35/00;* C12P *1/06*
U.S. Cl. 424—115 8 Claims

1. The Antibiotics-859A, produced by the controlled aerobic fermentation of *Streptomyces griseoruber* ATCC 39068 in an aqueous nutrient medium at a temperature range of 20° to 30° C., a pH range of 7.0 to 9.0 and a time range of from 24 to 200 hours, which has the following characteristics in its essentially pure form:

(a) white, slightly deliquescent powder.
(b) soluble in water,
(c) insoluble in lower alkanols,
(d) tlc (CH_2Cl_2/MeOH/AcOH/H_2O 60:30:5:5) R_f=0.50
(e) UV$\lambda_{Max}^{H_2O}$258, E%=208
(f) Characteristic IR (Kbr) as shown in FIG. 1,
(g) Characteristic proton NMR (D_2O) as shown in FIG. 2 with data as follows: Peaks at δ=0.77 (d, J=6), 1.23 (d, J=6), 1.27 (d, J=8), 1.37 (d, J=6), 2.03 (acetate), a complex pattern including peaks at=2.60, 2.67, 2.68, 2.76, 2.88, 2.91, 2.94 and 2.98, 3.09 (s), a group including multiplets centered at=4.12, 4.27, 4.45, 4.54, 4.56 and 4.18, 1.81 (HOD peak), 5.46 (d, J=8), 5.87 (d, J=8), and a pattern including peaks at 5.96, 6.01, 6.07, 6.13 and 6.75, 6.84 (t), 7.07 (d, J=8), 7.42 (d, J=8) and a complex pattern at=7-.2–7.4 (chemical shifts δ in ppm, coupling constants J in Hertz (Hz),
(h) the spectrum from ^{252}Cf pulse desportion mass spectrometry shows ions up to m/e 827 $(M+Na)^+$ which corresponds to a M.W. of 804,
(i) the electron impact mass spectrum of the product from treatment of the antibiotic with N,N-bis-tri-methylsilyltrifluoroacetamide shows characteristic peaks in the high mass region at m/c 1178, 1106, 1036, (746+4 to 6 (C_3H_8Si)); 999, 927, 955, (639+3 to 5 (C_3H_8Si)); 791, 719, 647 (431+2 to 4 (C_3H_8Si)); 840, 768 (522+3 to 4 (C_3H_8Si)),
(j) derivatization products from acid hydrolysis of the Antibiotics-859A give mass spectral evidence for the presence of uracil, tyrosine, phenylalanine, alanine and α, β-diaminobutyric acid.

4,521,409

USE OF GROWTH HORMONE TO ENHANCE RUMINANT MAMMARY DEVELOPMENT

Dale E. Bauman, Ithaca, N.Y., and Kris Sejrsen, Havndal, Denmark, assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,638
Int. Cl.[3] A61K *37/00, 35/55*
U.S. Cl. 514—21 6 Claims

1. A method of increasing the quantity of mammary parenchyma in a ruminant which comprises administering a mammary parenchyma growth stimulating amount of a ruminant growth hormone to said ruminant between about the onset of puberty and about the first parturition, thereby increasing milk production during subsequent lactations.

4,521,410

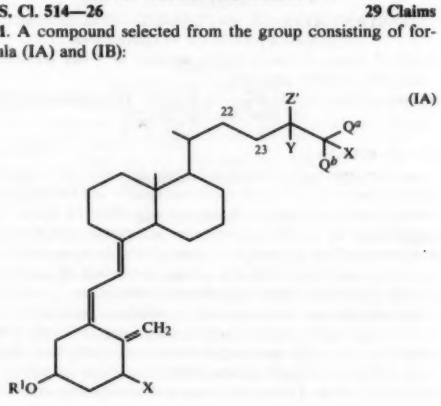
VITAMIN D GLYCOSYL ORTHOESTERS

Michael F. Holick, and Sally A. Holick, both of Sudbury, Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed May 3, 1984, Ser. No. 607,117
Int. Cl.[3] A01N *31/00;* A61K *31/70*
U.S. Cl. 514—26 29 Claims

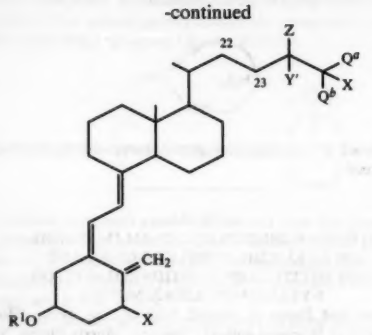
1. A compound selected from the group consisting of formula (IA) and (IB):

(IA)



-continued

(IB)



wherein the bond between carbons C-22 and C-23 is single or double;

Y is hydrogen, F, $-CH_3$ or $-CH_2CH_3$;

Z is F, H or X;

Y' is H, $-CH_3$ or $-CH_2CH_3$;

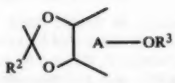
Z' is F or H;

Q^a is CF_3 or CH_2X;

Q^b is CF_3 or CH_3;

X is selected from the group consisting of hydrogen and OR^1, where R^1 is hydrogen or an orthoester glycoside moiety of the formula (II)

(II)



where A represents a glucofuranosyl or glucopyranosyl ring; R^2 is hydrogen, lower alkyl, aralkyl, or aryl; and R^3 is hydrogen or a straight or branched chain glycosidic residue containing 1–100 glycosidic units per residue;

with the proviso that at least one said R^1 is an orthoester glycoside radical of formula (II).

29. A method of treating calcium metabolic disorders in an animal which comprises administering to said animal an amount sufficient to regular calcium and phosphorous homeostasis in said animal, of a compound of any of claims 1, or 10–28.

4,521,411
ANALGESIC COMPOSITION

Theodora Koloff, 248 Nine Mile Rd., Ferndale, Mich. 48220

Filed Nov. 4, 1983, Ser. No. 548,659
Int. Cl.[3] A61K *35/78*
U.S. Cl. 424—195.1 3 Claims

1. A process for making a topical analgesic composition, comprising the steps of:

(a) forming an extract by mixing about 100 grams of ground or shredded *cotinus* leaves, about 90 grams of ground or shredded sassafras root, and about 150 grams of ground or shredded oak tree bark, with about one gallon of 70 percent wine spirit alcohol;

(b) allowing the admixture step (a) to stand for at least two weeks;

(c) dissolving about 50 grams benzocain, an amount of a procaine component containing an amount of procaine equivalent to about 50 grams of procaine hydrochloride, and about 50 grams menthol, in that order in said extract; and

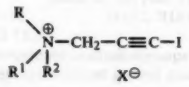
(d) separating said extract by filtering the product of step (c).

4,521,412
PESTICIDAL IODOPROPARGYLAMMONIUM SALTS

Hans-Georg Schmitt; Paul Reinecke, both of Leverkusen; Wilfried Paulus, Krefeld; Hermann Genth, Krefeld, and Walter Radt, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,899
Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218176
Int. Cl.[3] A01N *43/64, 33/12;* C07D *487/12*
U.S. Cl. 514—244 11 Claims

1. An iodopropargylammonium salt of the formula



in which

R and R^1 each independently is alkyl having 1 to 20 carbon atoms,

R^2 is alkyl having 4 to 20 carbon atoms, benzyl, phenethyl, or benzyl or phenethyl which is alkyl and halogen substituted, or a ferrocenylmethyl radical, or

R, R^1 and R^2, together with the nitrogen atom, form the Urotropin radical, and

$X^{\ominus}$ is an anion.

8. A pesticidal composition comprising a pesticidally effective amount of an iodopropargylammonium salt according to claim 1 in admixture with a diluent.

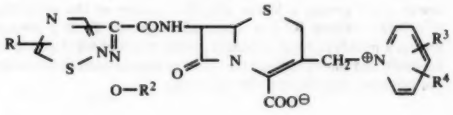
9. A method of combating pests which comprises applying to the pests or to a pest habitat a pesticidally effective amount of an iodopropargylammonium salt according to claim 1.

4,521,413
CEPHEM COMPOUNDS

Tsutomu Teraji, Osaka; Kazuo Sakane, Amagasaki, and Jiro Goto, Suita, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Sep. 2, 1982, Ser. No. 414,471
Claims priority, application United Kingdom, Sep. 14, 1981, 8127663; Dec. 14, 1981, 8137680; Jul. 1, 1982, 8218982
The portion of the term of this patent subsequent to Apr. 26, 2000, has been disclaimed.
Int. Cl.[3] C07D *501/38;* A61K *31/545*
U.S. Cl. 514—203 16 Claims

1. Cephem compounds of the formula:



wherein

R^1 is amino or a protected amino group;

R^2 is lower alkyl which may be substituted with one carboxy, lower alkenyl, lower alkynyl, cyclo (lower) alkyl or cyclo (lower) alkenyl;

R^3 is lower alkylamino, N-(lower) alkanoyl (lower) alkylamino, di (lower) alkylamino, sulfo (lower) alkylamino, hydroxy (lower) alkylamino, N-(lower) alkanoylhydroxy (lower) alkylamino, alkanoyloxy (lower) alkyl, alkenoyloxy (lower) alkyl, lower alkoxy (lower) alkoxy (lower) alkyl, di (lower) alkylamino (lower) alkyl, lower alkylthio (lower) alkyl, lower alkylthio, lower alkoxy, lower alkoxy (lower) alkoxy, hydroxy (lower) alkoxy, lower alkanesulfonyl (lower) alkyl, hydroxy (lower) alkylthio, di (lower) alkylamino (lower) alkylthio, tetrazolyl, tetrazolylthio, tetrazolylthio (lower) alkyl or dihydro-

triazinylthio (lower) alkyl substituted with oxo, hydroxy and lower alkyl; and

R^4 is hydrogen or lower alkyl; and pharmaceutically acceptable salts thereof.

4,521,414

OPHTHALMIC COMPOSITIONS AND THEIR USE FOR TREATING ELEVATED INTRAOCULAR PRESSURE AND GLAUCOMA

George C. Y. Chiou, College Station, Tex., and Hsin-Kuang Liu, Boston, Mass., assignors to The Texas A&M University System, College Station, Tex.

Filed Jun. 18, 1981, Ser. No. 272,889
Int. Cl.³ A61K *27/00*
U.S. Cl. 514—229 **17 Claims**

1. A method of reducing aqueous humor formation and intraocular pressure in mammals having ocular hypertension which comprises topically administering to a hypertensive eye an ophthalmologically acceptable amount, effective for lowering intraocular pressure, of a compound selected from R-(+)-1-tert-butylamino-3-[(4-morpholino-1,2,5-thiadiazol-3-yl)oxy]-2-propanol and ophthalmologically acceptable acid addition salts thereof.

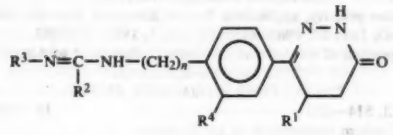
4,521,415

6-(SUBSTITUTED PHENYL)-4,5-DIHYDRO-3(2H)-PYRIDAZINONE COMPOUNDS

Tsutomu Katakami; Nobuyuki Fukazawa; Hajime Iizuka, all of Kanagawa; Takashi Nishina, Chiba; Joji Kamiya, Chiba; Yasuhito Tanaka, Chiba, and Takuo Nakano, Kanagawa, all of Japan, assignors to Mitsui Toatsu Kagaku Kabushiki Kaisha, Tokyo, Japan

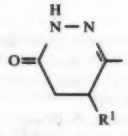
Filed Dec. 28, 1982, Ser. No. 454,021
Claims priority, application Japan, Dec. 28, 1981, 56-209938
Int. Cl.³ C07D *237/04*; A61K *31/50*
U.S. Cl. 514—252 **22 Claims**

1. A 6-(substituted phenyl)-4,5-dihydro-3(2H)-pyridazinone compound of the formula:



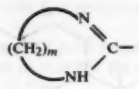
(I)

wherein R^1 is a lower alkyl group; R^2 is a hydrogen atom, a lower alkyl group, a lower alkylthio group or the grouping R^5—NH— where R^5 is a lower alkyl group; R^3 is a phenyl group, a pyridyl group, a benzyl group, a lower alkyl group or a substituted phenyl group carrying at any desired position on the benzene ring thereof the grouping:



where R^1 has the same meaning as given above; R^4 is a hydrogen atom or a halogen atom; n is 0 or 1; and when both R^2 and R^3 are lower alkyl groups, R^2 and R^3 may be combined together with the bridging member

between them to form the structure:



where m is 2 or 3, or a physiologically acceptable acid-addition salt thereof.

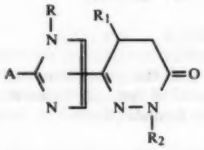
4,521,416

4,5-DIHYDRO-5-[(SUBSTITUTED)-1H-IMIDAZOL-4-YL OR 5-YL]-3(2H)-PYRIDAZINONES AND 6-[(SUBSTITUTED)-1H-IMIDAZOL-4-YL OR 5-YL]-3(2H)-PYRIDAZINONES

Ila Sircar, and James A. Bristol, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 22, 1983, Ser. No. 477,697
Int. Cl.³ A61K *31/50*; C07D *237/06*
U.S. Cl. 514—252 **10 Claims**

1. A compound of the formula



wherein is a single or double bond; A is hydrogen, lower alkyl, phenyl, phenyl substituted by lower alkyl, halo or trifluoromethyl, or pyridinyl; R, R_1, and R_2 are independently hydrogen or lower alkyl, and pharmaceutically acceptable acid addition salts thereof.

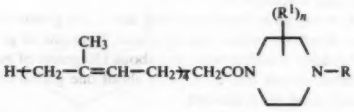
4,521,417

GERANYLGERANYLACETAMIDE COMPOUNDS HAVING A PIPERAZINE RING, SALTS THEREOF, PHARMACEUTICAL COMPOSITIONS CONTAINING SAID COMPOUNDS, AND METHOD OF TREATING ULCERS IN MAMMALS

Hiromasa Nakamoto, Takaoka; Michitaka Ogawa, Uozu; Muneo Kobayashi, Toyama; Yuki Nogami, Toyama; Kazuo Kumamoto, Toyama; Hiroko Murakami, Toyama; Yoichi Ninagawa, Hasaki; Yoshiaki Omura, Mitsu, and Masao Mizuno, Kurashiki, all of Japan, assignors to Nihon Iyakuhin Kogyo Co., Ltd., Toyama and Kuraray Co., Ltd., Kurashiki, both of, Japan

Filed Jun. 6, 1983, Ser. No. 501,391
Claims priority, application Japan, Jun. 7, 1982, 57-96341
Int. Cl.³ A61K *31/495*; C07D *241/04*
U.S. Cl. 514—255 **18 Claims**

1. A geranylgeranylacetamide compound having a piperazine ring represented by the formula

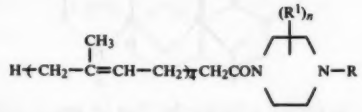


wherein R represents a member selected from the class consisting of a hydrogen atom, C_1–C_5 alkyl groups which are unsubstituted or mono-substituted by a halogen atom, C_2–C_5 alkenyl groups and C_7–C_8 aralkyl groups, R^1 represents a C_1–C_3 alkyl group and n represents 0, 1 or 2,

or a pharmaceutically acceptable acid addition salt thereof.

18. A method for the treatment of an ulcer in a mammal,

which comprises administering to said subject an effective amount of a geranylgeranylacetamide compound having a piperazine ring represented by the formula



wherein R represents a member selected from the class consisting of a hydrogen atom, C_1–C_5 alkyl groups which are unsubstituted or mono-substituted by a halogen atom, C_2–C_5 alkenyl groups and C_7–C_8 aralkyl groups, R^1 represents a C_1–C_3 alkyl group and n is 0, 1, or 2,
or a pharmaceutically acceptable acid addition salt thereof.

4,521,418

GUANIDINOTHIAZOLYL DERIVATIVES

Thomas H. Brown, Tewin, and Graham J. Durant, Welwyn Garden City, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

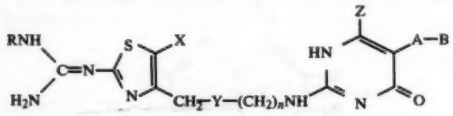
Filed Feb. 12, 1980, Ser. No. 120,807

Claims priority, application United Kingdom, Feb. 21, 1979, 7906070

Int. Cl.³ A61K *31/505;* **C07D** *419/14, 417/14*

U.S. Cl. 514—272 **8 Claims**

1. A compound of the formula



in which R is hydrogen, C_1–C_6 alkyl, C_1–C_6 alkanoyl or benzoyl; X is hydrogen, chlorine, bromine or C_1–C_6 alkyl; Y is sulphur or methylene; n is 2 or 3; Z is hydrogen or lower alkyl; A is C_1–C_5 alkylene or $-(CH_2)_pW(CH_2)_q-$ where W is oxygen or sulphur and p and q are such that their sum is from 1 to 4; B is heteroaryl selected from imidazolyl, pyrimidyl, pyrazinyl, pyridazyl, 5-amino-1,3,4-thiadiazolyl, 1,3-dioxolopyridyl and benzimidazolyl, or B is 6-(2,3-dihydro-1,4-benzodioxinyl), or 4- or 5-(1,3-benzodioxolyl); and pharmaceutically acceptable acid addition salts thereof.

8. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof in an effective amount to block said receptors a compound of claim 1.

4,521,419

CONDENSED CYCLOALIPHATIC DERIVATIVES OF SUBSTITUTED PYRIDO[1,2-a]PYRIMIDINES AND METHODS OF TREATING ALLERGIC CONDITIONS, PEPTIC ULCERS AND INHIBITING GASTRIC ACID SECRETION WITH THEM

Gianfederico Doria, Milan; Carlo Passarotti, Gallarate; Pier P. Lovisolo, and Ada Buttinoni, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

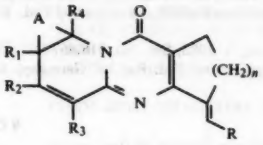
Filed Apr. 27, 1983, Ser. No. 489,057

Claims priority, application United Kingdom, Apr. 29, 1982, 8212429; Apr. 6, 1983, 8309259

Int. Cl.³ A61K *31/505;* **C07D** *471/04*

U.S. Cl. 514—267 **10 Claims**

1. A compound of general formula (I)



(I)

wherein

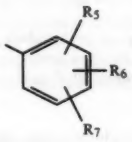
n is 1 or 2;

R_1 represents a hydrogen or a halogen atom, a C_1–C_4 alkyl group, a —CN group, a $—CONH_2$ group or a $—COOR_8$ group, wherein R_8 represents hydrogen or a C_1–C_6 alkyl group, unsubstituted or substituted by di(C_1–C_4)-alkylamino;

each of R_2, R_3 and R_4 independently represents a hydrogen or a halogen atom, a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group or a C_3–C_4 alkenyloxy group;

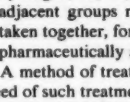
A completes a bond, thereby providing a double bond or, when R_1 is $—COOR_8$ wherein R_8 is as defined above, A may represent also a $—CH_2—$ group, thereby providing a cyclopropane ring fused to the pyrido ring;

R is (a) furyl, thienyl or pyridyl; or (b) a group of formula



wherein

each of R_5, R_6 and R_7 represents, independently, a hydrogen or a halogen atom, hydroxy, formyloxy, C_2–C_8 alkanoyloxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro or a



group,

wherein each of R_9 and R_{10} independently represents hydrogen, C_1–C_4 alkyl, formyl or C_2–C_8 alkanoyl, or adjacent groups represented by two of R_5, R_6 and R_7, taken together, form a C_1–C_3 alkylenedioxy group; or the pharmaceutically acceptable salts thereof.

8. A method of treatment of allergic conditions in a patient in need of such treatment, said method comprising administering an anti-allergic effective amount of the compound according to claim 1.

9. A method for the treatment of peptic ulcers in a patient comprising administering an anti-ulcerogenic effective amount of the compound according to claim 1.

10. A method for inhibiting gastric acid secretion in a patient comprising administering to the patient a gastric acid secretion inhibitory effective amount of the compound according to claim 1.

4,521,420
OXOQUINAZOLINE CARBAMATES

Fritz Maurer, Wuppertal; Wilhelm Brandes, Leichlingen; Karl-Heinz Kuck, Langenfeld; Paul Reinecke, and Hans Scheinpflug, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

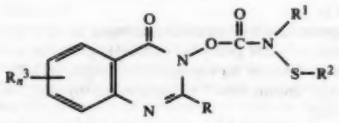
Filed Aug. 1, 1983, Ser. No. 518,867

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228871

Int. Cl.³ A61K *31/505;* **C07D** *239/90*

U.S. Cl. 514—259 **9 Claims**

1. An oxoquinazoline carbamate of the formula



in which

R represents hydrogen, straight-chain or branched alkyl, alkoxy, alkoxyalkyl, alkylthio or alkylthioalkyl, each having up to 6 carbon atoms per alkyl radical, halogenoalkyl having up to 3 carbon atoms and up to 7 identical or different halogen atoms, or aryl which has 6 to 10 carbon atoms and is optionally monosubstituted or polysubstituted by identical or different substituents selected from alkyl having up to 4 carbon atoms, halogenoalkyl having up to 3 carbon atoms and up to 5 halogen atoms, and halogen,

R^1 represents straight-chain or branched alkyl having up to 6 carbon atoms,

R^2 represents halogenoalkyl having up to 3 carbon atoms and up to 7 identical or different halogen atoms,

R^3 represents straight-chain or branched alkyl having up to 4 carbon atoms, or halogen, and

n represents a number from 0 to 3.

8. A method of combatting fungi which comprises administering to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim **1**.

4,521,421
TREATMENT OF SEXUAL DYSFUNCTION

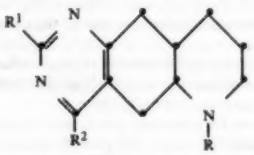
Mark M. Foreman, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 26, 1983, Ser. No. 535,474

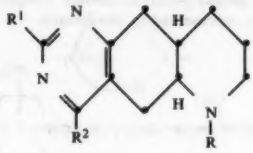
Int. Cl.³ A61K *31/505*

U.S. Cl. 514—267 **10 Claims**

1. A method for treating sexual dysfunction in mammals suffering from such dysfunction and in need of treatment which comprises administering to said mamals an effective dose of a trans-(±)-racemate of the formula



or of a stereoisomer thereof of the formula



wherein R is C_1–C_3 alkyl or allyl, R^1 is NH_2, NHR^3 or NR^4R^5 and R^2 is H, Cl, Br or CH_3; wherein R^3 is methyl, ethyl, n-propyl, C_1–C_3 alkyl-CO, phenyl-CO wherein said substituents are 1 or 2 members of the group; Cl, F, Br, CH_3, C_2H_5, CH_3O, C_2H_5O and CF_3; and R^4 and R^5 are individually methyl, ethyl or n-propyl; and pharmaceutically acceptable acid addition salts thereof.

4,521,422
ARYL AND HETEROARYL[7-(ARYL AND HETEROARYL)PYRAZOLO[1,5-a]PYRIMIDIN-3-YL]METHANONES

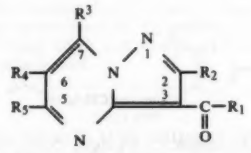
John P. Dusza, Nanuet, N.Y.; Andrew S. Tomcufcik, Old Tappan, N.J., and Jay D. Albright, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 506,966, Jun. 23, 1983, abandoned. This application May 24, 1984, Ser. No. 612,812

Int. Cl.³ C07D *487/04;* **A61K** *31/505*

U.S. Cl. 514—258 **31 Claims**

1. A compound selected from those of the formula:



wherein R_1 is selected from the group consisting of unsubstituted phenyl; phenyl mono- or di-substituted by halogen, alkoxy(C_1–C_3) or alkyl(C_1–C_3); phenyl mono-substituted by trifluoromethyl, alkylthio(C_1–C_3), alkylamino(C_1–C_3), dialkylamino(C_1–C_3), methylenedioxy, alkylsulfonyl(C_1–C_3) or alkanoylamino(C_1–C_3); naphthalenyl; thiazolyl; biphenyl; thienyl; furanyl; pyridinyl; substituted thiazolyl; substituted biphenyl; substituted thienyl; and substituted pyridinyl wherein the substituents are selected from one or two of the group consisting of halogen, alkoxy(C_1–C_3) and alkyl(C_1–C_3); R_2, R_4 and R_5 are each selected from the group consisting of hydrogen and alkyl(C_1–C_3); and R_3 is selected from the group consisting of unsubstituted phenyl, phenyl mono-substituted by halogen, trifluoromethyl, alkoxy(C_1–C_3), amino, alkyl(C_1–C_3), alkylamino(C_1–C_6), dialkylamino(C_1–C_3), alkanoylamino(C_1–C_6), N-alkyl(C_1–C_6)alkanoylamino(C_1–C_6), cyano or alkylthio(C_1–C_3); furanyl; thienyl; pyridinyl; and pyridine-1-oxide.

4,521,423
7,8,9,10-TETRAHYDROBENZO[H]QUINOLIN-9-AMINE DERIVATIVES AND COMPOSITIONS AND METHODS FOR TREATING DEPRESSION EMPLOYING THEM

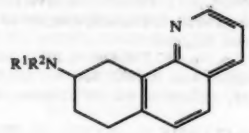
Andre A. Asselin, St. Laurent, Canada, and Leslie G. Humber, North Brunswick, N.J., assignors to Ayerst, McKenna & Harrison, Ltd., Montreal, Canada

Filed Oct. 31, 1983, Ser. No. 547,318

Int. Cl.³ A61K *31/47;* **C07D** *221/10*

U.S. Cl. 514—290 **4 Claims**

1. A compound of the formula



in which R^1 and R^2 each independently is lower alkyl, or a therapeutically acceptable acid addition salt thereof.

3. A pharmaceutical composition in unit dosage form for treating depression which comprises the compound of claim 1, or a therapeutically acceptable acid addition salt thereof, and a pharmaceutically acceptable carrier.

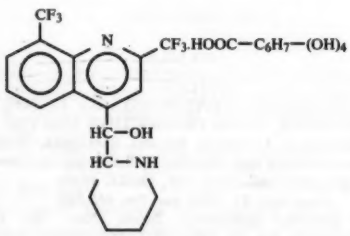
4. A method for treating depression comprising administering to a host in need thereof an antidepression effective unit of the compound of claim 1.

4,521,424
QUINATE SALTS OF THE ANTIMALARIAL COMPOUND MEFLOQUINE

Jean F. Rossignol, Philadelphia, Pa., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Feb. 27, 1984, Ser. No. 584,183
Int. Cl.³ C07D *401/06;* A61K *31/47*
U.S. Cl. 514—314 **6 Claims**

1. A compound represented by the following structural formula (I):



(I)

which is α-2-piperidinyl-2,8-bis(trifluoromethyl)-4-quinolinemethanol quinate.

6. A method for the treatment of malaria in a subject in need of said treatment comprising administering orally or by injection a nontoxic antimalarial quantity of a compound of claim 1.

4,521,425
AGENTS AFFECTING THE PRODUCTION OF HORMONES IN LIVING MAMMALS

Davide R. Grassetti, 26 Northgate Ave., Berkeley, Calif. 94708

Continuation-in-part of Ser. No. 307,237, Nov. 2, 1981, abandoned. This application Aug. 31, 1983, Ser. No. 528,226
Int. Cl.³ A61K *31/455*
U.S. Cl. 514—350 **2 Claims**

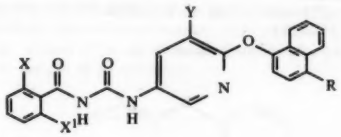
1. The method of treating a mammal to decrease its blood cortisol level which comprises administering to a mammal in need of such treatment an amount of 6-mercaptonicotinic acid, its alkali metal salts or its lower alkyl esters effective to reduce the blood cortisol level of said mammal.

4,521,426
PESTICIDAL BICYCLOOXYHETEROCYCLYL AROYL UREAS

Paul A. Cain, Cary, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1982, Ser. No. 428,994
Int. Cl.³ C07D *213/64;* A01N *43/40*
U.S. Cl. 514—346 **45 Claims**

1. A compound of the formula:



wherein X and X′ are halo or lower alkoxy, Y is hydrogen, halo or lower alkyl, and R is hydrogen, halo, or lower alkoxy.

4,521,427
APPETITE SUPPRESSANT AND METHOD OF APPLICATION THEREOF

Ronald S. Nietupski, 16500 Spaniel Dr., Lockport, Ill. 60441

Filed May 17, 1983, Ser. No. 495,436
Int. Cl.³ A61K *31/44*
U.S. Cl. 514—354 **5 Claims**

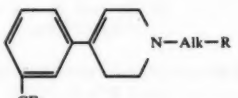
1. A method of appetite suppression which comprises administration by inhalation to a person in need thereof, a volatile appetite suppressant composition comprising an effective amount 2-acetylpyridine.

4,521,428
ANOREXIGENIC TRIFLUOROMETHYLPHENYLTETRAHYDROPYRIDINES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Dino Nisato, Pavia; Marco Frigerio, Mantova, and Giovanna F. Miranda, Milan, all of Italy, assignors to Sanofi, Paris, France

Filed Aug. 16, 1983, Ser. No. 523,565
Claims priority, application France, Aug. 16, 1982, 82 14159
Int. Cl.³ C07D *401/06;* A61K *31/44*
U.S. Cl. 514—277 **12 Claims**

1. A 4-(3-trifluoromethylphenyl)-1,2,3,6-tetrahydropyridine of formula



wherein R represents an unsubstituted or by an alkyl group of from 1 to 4 carbon atoms substituted pyridyl, pyridyl 1-oxide or naphthyl group and Alk represents a straight or branched chain alkylene group of from 2 to 4 carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

4,521,429
VINYLAZOLES AND THEIR USE FOR CONTROLLING FUNGI

Norbert Meyer, Ladenburg; Bernd Zeeh; Ernst Buschmann, both of Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

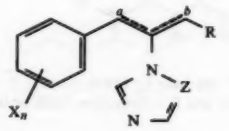
Filed Jan. 26, 1982, Ser. No. 342,933

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1981, 3103068

Int. Cl.³ A01N *43/50, 43/64;* C07D *233/60, 249/08*

U.S. Cl. 514—383 12 Claims

1. Vinylazoles of the formula



(I)

where R is alkyl of 1 to 7 carbon atoms, phenyl or halogen-substituted phenyl where the double bond occupies position b and is n-propyl, isopropyl, tert.-butyl, n-butyl, n-pentyl, n-hexyl, n-heptyl, phenyl or halogen substituted phenyl where the double bond occupies position a, X is hydrogen, halogen, alkyl of 1 to 4 carbon atoms or phenyl, Z is N or CH and n is an integer from 1 to 5, and plant-tolerated acid addition salts and metal complexes thereof.

12. A process for combating fungi, wherein a fungicidally effective amount of a vinylazole of the formula I as defined in claim 1 is allowed to act on the fungi, or materials, areas, plants or seed threatened by fungus attack.

4,521,430
1,5-BENZOTHIAZEPIN-4-ONE, THEIR PHARMACEUTICAL COMPOSITOINS, AND METHODS OF USE

Tokuro Oh-ishi, Tokyo; Mikio Takeda; Hiromichi Nakajima, both of Urawa, and Taku Nagao, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

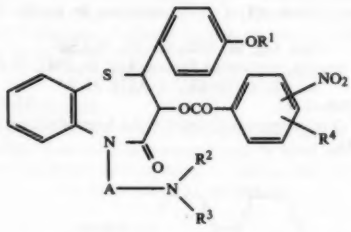
Filed May 25, 1984, Ser. No. 614,743

Claims priority, application United Kingdom, Jun. 11, 1983, 8316032

Int. Cl.³ A61K *31/555;* C07D *281/02*

U.S. Cl. 514—211 15 Claims

1. A compound of the formula:



(I)

wherein R^1 and R^2 are each lower alkyl, R^3 is hydrogen, lower alkyl or hydroxy-lower alkyl, R^4 is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkylthio or nitro, and A is lower alkylene, or a pharmaceutically acceptable acid addition salt thereof.

14. A method of producing a cerebral vasodilating effect on a warm-blooded animal comprising administering to said warm-blooded animal an effective amount of the compound claimed in claim 1.

4,521,431
AMINOALKYL FURAN DERIVATIVE

Derek L. Crookes, Hertford, England, assignor to Glaxo Group Limited, London, England

Continuation of Ser. No. 307,575, Oct. 1, 1981, abandoned. This application Aug. 9, 1982, Ser. No. 406,710

Claims priority, application United Kingdom, Oct. 1, 1980, 8031634

Int. Cl.³ A01K *31/34;* C07D *307/52*

U.S. Cl. 514—471 18 Claims

1. Form 2 ranitidine hydrochloride characterised by an infra-red spectrum as a mull in mineral oil showing the following main peaks:

3260	1075
3190	1045
3100	1021
2560	1006
2510	991
2470	972
1620	958
1590	810
1570	800
1263	760
1230	700
1220	660
1195	640
1163	620 cm^{-1}
1130	

17. A method of treating condition mediated through histamine H_2-receptors which comprises administering to a patient an effective amount of a compound as claimed in claim 1 to relieve said condition.

4,521,432
PHYSIOLOGICALLY ACTIVE SUBSTANCE FA-5859, ITS DERIVATIVE, THEIR PRODUCTION AND USE

Tsuneo Kanamaru, Takatsuki; Susumu Shinagawa, Higashiosaka, and Mitsuko Asai, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

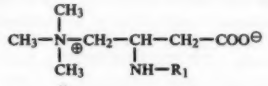
Filed Nov. 17, 1982, Ser. No. 442,368

Claims priority, application Japan, Nov. 26, 1981, PCT/JP81/00355; Jul. 28, 1982, PCT/JP82/00291; Oct. 15, 1982, PCT/JP82/00409

Int. Cl.³ C07C *87/30;* A61K *31/24, 31/195*

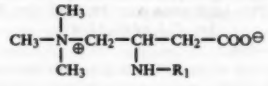
U.S. Cl. 514—556 4 Claims

1. A compound of the formula:



wherein R_1 is a hydrogen atom or an acetyl group, or a pharmacologically acceptable salt thereof.

4. An antidiabetic agent which contains an antidiabetically effective amount of the formula



wherein R_1 is a hydrogen atom or an acetyl group, or a pharmacologically acceptable salt thereof, and conventional carrier.

4,521,433

PROCESS FOR CHEESE MAKING

Peter M. Linklater, Randwick, and George W. Browning, Coogee, both of Australia, assignors to The Commonwealth of Australia, Belconnen, Australia

Filed Oct. 11, 1983, Ser. No. 540,994
Claims priority, application Australia, Oct. 13, 1982, PF6328
Int. Cl.³ A23C *19/00*
U.S. Cl. 426—36 3 Claims

1. A process of making cheese having a desired pH which comprises the steps of
(a) coagulating milk,
(b) cutting the coagulum to produce curd and whey,
(c) continuously monitoring the pH of the whey by withdrawing a sample of whey from said curd and whey,
(d) continuously treating the sample of whey to remove fines by
(i) passing the whey upwardly up a settling tube such that the rate at which the whey passes upwards is less than the rate of settling of the fines, and
(ii) filtering the treated sample of whey to further remove fines, resulting in a turbid whey sample;
(e) mixing an indicator with said treated filtered whey sample, the indicator
(i) having an absorbance at the wavelength in the visible region characteristic of a coloured form of the indicator,
(ii) having substantially no tendency to bind to milk proteins in said whey sample, and
(iii) having a pK_a value in the region 5.5 to 7.1;
(f) determining the optical absorption of said indicator-whey mixture, and deriving the pH of the whey sample from said absorption;
(g) separating the curd and whey at a desired pH; and
(h) further processing the separated curd into cheese having the desired pH.

4,521,434

FERMENTATION METHOD AND COMPOSITIONS INCLUDING A LACTOBACILLUS SPECIES STRAIN

Mark A. Matrozza, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed Sep. 27, 1982, Ser. No. 423,601
Int. Cl.³ C12N *1/20;* A23L *1/31*
U.S. Cl. 426—59 12 Claims

1. A bacterial concentrate for fermenting meat to produce sausage which consists essentially of:
(a) a biologically pure culture of cells of a Lactobacillus having the essential identification characteristics of Lactobacillus sp. NRRL-B-15,036 which cells ferment dextrose to produce lactic acid and are unsable to ferment lactose and sucrose to produce lactic acid, wherein the concentrate contains at least about 1×10^8 cells per ml in a nutrient medium and is in a storage stable form; and
(b) a stimulatory food grade metal salt in an amount sufficient to accelerate fermentation in meat by the Lactobacillus to produce fermented sausage.

4,521,435

HAMBURGER-TYPE MEAT PATTIES

Leo Peters, 750 Plymouth Rd., SE., Grand Rapids, Mich. 49506

Continuation-in-part of Ser. No. 221,896, Dec. 31, 1980, abandoned. This application Mar. 4, 1983, Ser. No. 472,108
Int. Cl.³ A23L *1/31*
U.S. Cl. 426—92 13 Claims

1. A fried hamburger-type meat patty, with a coating on said patty that seals in substantially all of said patty's original raw weight juice, said coating being invisible and inseparable from the meat of said patty and including at least 30% by weight dry powdered egg whites.

4,521,436

REHYDRATABLE RICE PRODUCT

Wen C. Lou, Yorktown Hgts., and Charles V. Fulger, Millwood, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jul. 27, 1983, Ser. No. 517,862
Int. Cl.³ A21D *2/00, 10/00;* A23L *1/10*
U.S. Cl. 426—104 22 Claims

1. A composition for the production of a rehydrateable rice product consisting of from 90.0 to 99.5 percent by weight of ungelatinized rice selected from the group consisting of rice flour, rice milk, head rice and mixtures thereof, from 0.2 to 5.0 percent by weight of an aerating agent, and from 0.1 to 3.5 percent by weight of an emulsifier.

4,521,437

POUCHES OF ETHYLENE/OCTENE-1 COPOLYMER FILM CONTAINING A FLOWABLE MATERIAL

William J. Storms, Oshawa, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Jun. 2, 1983, Ser. No. 500,386
Claims priority, application United Kingdom, Jun. 2, 1982, 82016100
Int. Cl.³ A23G *9/04;* B32B *27/34, 27/08*
U.S. Cl. 426—130 13 Claims

1. A pouch containing a flowable material, said pouch being made from a sealant film in tubular form and having transversely heat-sealed ends, said sealant film being made from a material comprising about 50 to 100 parts of a linear copolymer of ethylene and an octene-1 having a density of from 0.916 to 0.930 g/cm³ and a melt index of 0.3 to 2.0 dg/min, and from 0 to 50 parts by weight of at least one polymer selected from the group consisting of a linear copolymer, of ethylene and a C_4–C_{10} α-olefin having a density of from 0.916 to 0.930 g/cm³ and a melt index of from 0.3 to 2.0 dg/min, and a high-pressure polyethylene having a density of from 0.916 to 0.924 g/cm³ and a melt index of from about 1 to 10 dg/min, said sealant film being selected on the basis of providing (a) pouches with an M-test value substantially smaller at the same film thickness, than that of pouches made with film of a blend of 85 parts of a linear ethylene/butene-1 copolymer having a density of about 0.919 g/cm³ and a melt index of about 0.75 dg/min and 15 parts of a high pressure polyethylene having a density of about 0.918 g/cm³ and a melt index of 8.5 dg/min, or (b) an M(2)-test value of less than about 12%, for pouches having a volume of from greater than 1.3 to 5 liters, or (c) M(1.3)-test value of less than about 5% for pouches having a volume of from 0.1 to 1.3 liters.

4,521,438

COFFEE EXTRACT DECAFFEINATION METHOD

Bary L. Zeller, Pleasantville, N.Y.; William W. Kaleda, Westwood, N.J., and Fouad Z. Saleeb, Pleasantville, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sep. 29, 1983, Ser. No. 537,143
Int. Cl.³ A23F *5/22*
U.S. Cl. 426—271 12 Claims

1. A method of decaffeinating a caffeine-containing coffee extract which comprises:
(a) combining caffeic acid with a caffeine-containing coffee extract so as to form an insoluble colloidal, caffeic acid/-caffeine complex;
(b) growing crystals of the insoluble caffeic acid/caffeine complex which can be separated from the liquid;
(c) separating the insoluble caffeic acid/caffeine complex crystals from the decaffeinated liquid.

4,521,439
BLANCHING PROCESS

Bengt L. Bengtsson, Bjuv; Peter Palmlin, and Bertil K. Saldert, both of Halsingborg, all of Sweden, assignors to Nestec, S.A., Vevey, Switzerland

Filed Mar. 8, 1984, Ser. No. 587,534

Claims priority, application European Pat. Off., May 4, 1983, 83104381.5

Int. Cl.³ A23L *1/00*

U.S. Cl. 426—509 **10 Claims**

1. A process for blanching vegetables comprising subjecting the vegetables to a first blanching step for a period of from 1 to 30 seconds at a temperature from 90° C. to 100° C. in water or steam and then to a second blanching step for a period of from 1 to 60 minutes at a temperature from 45° C. to 90° C. in water.

4,521,440
WATER-IN-OIL EMULSIONS

Gabriël J. T. Leusbergen, s'Gravenzande, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 566,123

Claims priority, application Netherlands, Dec. 30, 1982, 8205047

Int. Cl.³ A23D *3/00, 3/02, 5/00*

U.S. Cl. 426—602 **30 Claims**

1. Edible water-in-oil emulsion comprising an aqueous phase emulsified in a fat phase, fat constituting 30 to 84% by weight of the total emulsion and comprising:

(i) b 15–60% of a structure-imparting hard fat component, consisting essentially of a mixture of triglycerides obtained by random interesterification of a substantially completely hydrogenated fat (a) which is rich in C_8–C_{14} fatty acid residues or by random interesterification of 60–90% of a non-hydrogenated fat (a) and 10–40% of a fat (b) in which 40–100% of the fatty acid residues are saturated and mainly contain 16–22 carbon atoms;

(ii) 40–85% of an oil which does not substantially contribute to the consistency of the emulsion within the temperature range from 5° to 35° C. and which is substantially free of solid fat crystals at 10° C;

(iii) 0–25% of an oil hydrogenated to a melting point of from 30° to 45° C.; and

wherein the ratio of linoleic acid to the sum of saturated and trans fatty acids is at least 0.4 and the sum of components (i), (ii) and (iii) being equal to 100%.

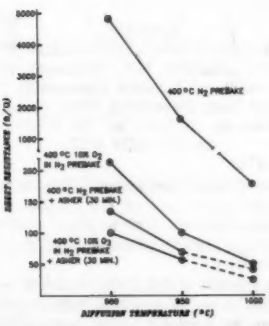
4,521,441
PLASMA ENHANCED DIFFUSION PROCESS

Dervin L. Flowers, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1983, Ser. No. 562,679

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 **15 Claims**



1. A process for doping a semiconductor substrate which comprises the steps of: applying spin-on dopant material to said substrate; heating said material to a first temperature; plasma treating said material to enhance the conductivity of diffused regions formed therefrom; and heating said substrate to a second temperature higher than said first temperature.

4,521,442
RADIANT ENERGY COLLECTOR HAVING PLASMA-TEXTURED POLYIMIDE EXPOSED SURFACE

C. Richard Guarnieri, Somers, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 393,952, Jun. 30, 1982, Pat. No. 4,478,209. This application May 9, 1984, Ser. No. 608,467

Int. Cl.³ F24J *3/02*; B05D *3/14*

U.S. Cl. 427—38 **14 Claims**

1. A method for imparting increased absorptivity and reduced emissivity for radiant energy of a material which comprises coating said material on at least a portion of the surface thereof exposed to radiant energy with polyimide and surface texturizing said polyimide whereby the polyimide coated material exhibits increased absorptivity and reduced emissivity for radiant energy.

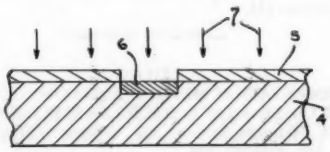
4,521,443
INTEGRATED OPTICAL WAVEGUIDE FABRICATION BY ION IMPLANTATION

Ishverlal K. Naik, Rancho Palos Verdes, and Ronald G. Eguchi, Lakewood, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed May 7, 1984, Ser. No. 607,499

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 **6 Claims**



1. A method for fabricating an optical device in a silicon dioxide substrate, comprising:

bombarding a selected area of the substrate with nitrogen ions to implant the ions in a region of the substrate below the selected area so as to raise the index of refraction of the region; and

heating the substrate to anneal the substrate so as to repair a substantial portion of any damage to the atomic structure of the substrate caused by the ion bombardment.

4,521,444
METHOD OF PROVIDING A METAL LAYER ON A SUBSTRATE

Johannes J. Ponjee; Johan W. A. Nelissen, and Christiaan J. A. Verwijlen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,402

Claims priority, application Netherlands, Dec. 10, 1982, 8204783

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—41 **4 Claims**

1. A method of providing a metal layer on a hydrophilic surface of a substrate by means of a bonding intermediary selected from the group consisting of alkoxysilylalkylthiols, alkoxysilylalkylamines and chlorosilylalkylthiols comprising exposing said surface of said substrate with an atmosphere in which said bonding intermediary is present in vapor form until

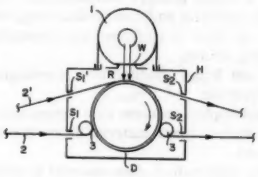
a monomer layer of said intermediary of a thickness of at most 15 molecules is formed on said hydrophilic surface and providing, by vapor deposition a metal layer of a thickness of 50–300 nm on the exposed surface of the resultant layer of said intermediary.

4,521,445

METHOD AND APPARATUS FOR ELECTRON CURING ON A COOLED DRUM

Sam V. Nablo, Lexington, and Edwin P. Tripp, III, Wilmington, both of Mass., assignors to Energy Sciences, Inc., Woburn, Mass.

Filed Apr. 22, 1983, Ser. No. 487,461
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—44 **27 Claims**



1. A method of transfer-coating electron-beam-curable material, that comprises, drawing over the external surface of a rotating metal drum a first web carrying such material, drawing a second web past the drum in contact with the first web at a predetermined region adjacent to the external surface of the drum, and directing electron-beam radiation upon said region from a location external to the drum to cure said material and transfer the same to said second web.

3. A method of transfer-coating electron-beam-curable material, that comprises applying said material to the external surface of a rotary metal drum, rotating said drum past a region where elctron-beam radiation is directed upon the external surface of the drum from a location external to the drum to cure said electron-beam-curable material, and providing sufficient shielding in the material of the drum itself to prevent appreciable radiation generated by the stopping of the electron beam radiation in said electron-beam-curable material and the drum from passing through the drum to the side of the drum opposite to said region and to reduce the radiation level at said side of the drum to no more than 2.5 mr/hr for electron-beam radiation up to 300 KEV energy level.

4,521,446

METHOD FOR DEPOSITING POLYSILICON OVER TiO_2

Donald J. Coleman, Jr., Plano; Roger A. Haken, Richardson, and Chung S. Wang, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 344,563, Feb. 1, 1982, abandoned. This application Nov. 30, 1983, Ser. No. 557,382
Int. Cl.³ H01L *21/316*
U.S. Cl. 427—86 **9 Claims**

1. A method for depositing polysilicon on TiO_2, comprising the steps of:

depositing a layer of TiO_2; annealing said TiO_2 layer in hydrogen to provide an appropriate surface for the deposition of polysilicon; and

depositing polysilicon on said annealed TiO_2,

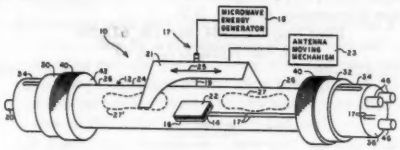
thereby providing a polysilicon layer which is not hazy.

4,521,447

METHOD AND APPARATUS FOR MAKING LAYERED AMORPHOUS SEMICONDUCTOR ALLOYS USING MICROWAVE ENERGY

Stanford R. Ovshinsky, Bloomfield Hills; Stephen J. Hudgens, Southfield, both of Mich., and Marc A. Kastner, Newton Lower Falls, Mass., assignors to Sovonics Solar Systems, Solon, Ohio

Division of Ser. No. 435,068, Oct. 18, 1982, abandoned. This application Dec. 23, 1983, Ser. No. 565,033
Int. Cl.³ B05D *3/02, 3/06, 5/12*
U.S. Cl. 427—45.1 **21 Claims**



1. A process for depositing amorphous alloy materials in layered form onto a receiving surface comprising:

providing at least one source of microwave energy;

providing at least two reaction bases, each said gas containing at least one alloying element to be deposited onto said receiving surface;

selectively exciting said reaction gases with said microwave energy to create from said reaction gases sequentially excited species containing said alloying elements to be deposited to form at least one region or layer of amorphous alloy material; and

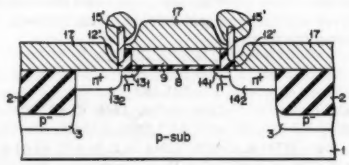
depositing said alloy in a plurality of alternating sublayers onto said receiving surface to form said amorphous alloy material region.

4,521,448

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Yoshitaka Sasaki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 3, 1983, Ser. No. 471,651
Claims priority, application Japan, Mar. 16, 1982, 57-41331
Int. Cl.³ H01L *21/283*
U.S. Cl. 427—88 **26 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

forming a thin film on a semiconductor body on which a protruding pattern is formed, with said thin film covering both the sides and the top of said protruding pattern;

performing a selective anisotropic etching on said thin film for a distance corresponding to said thin film thickness, thereby removing a portion of said thin film including that portion covering the top of said protruding pattern and leaving a portion of said thin film covering said sides of said protruding pattern, thus forming a thin film pattern surrounding at least a portion of the protruding pattern;

etching at least a top part of the protruding pattern while

leaving said thin film pattern to extend upwardly from the surface of said semiconductor body;

forming a conductive film covering the semiconductor body including said thin film pattern; and

dividing said conductive film into portions by removing said thin film pattern.

4,521,449

PROCESS FOR FORMING A HIGH DENSITY METALLURGY SYSTEM ON A SUBSTRATE AND STRUCTURE THEREOF

Anthony F. Arnold, and Arnold F. Schmeckenbecher, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 21, 1984, Ser. No. 612,296

Int. Cl.³ H05K *3/12, 3/46*

U.S. Cl. 427—96 **15 Claims**

PROVIDE UNSINTERED CERAMIC SUBSTRATE
FORM INDENTED FAN-OUT PATTERN IN SURFACE
FILL INDENTED PATTERN WITH CONDUCTIVE PASTE
SELECTIVELY APPLY DIELECTRIC LAYER OVER SURFACE LINES
SINTER SUBSTRATE

1. A process for forming a high density solder pad and fan-out metallurgy system for electrically connecting an integrated circuit semiconductor device to a support substrate comprising,

providing an unsintered green ceramic substrate with an internal metallurgy system including a matrix of vias on the top surface filled with conductive metal paste,

forming indented areas in the top surface of said green ceramic substrate that are interspersed between said vias, and indented lines that are joined to the indented areas and radiate generally outwardly forming a fan-out configuration,

filling the indented areas and lines with a conductive metal paste,

screening a dielectric layer of ceramic material on the top surface of said substrate that covers said indented lines but leaves said vias and said indented areas exposed, and

sintering the substrate.

4,521,450

METHOD OF INCREASING THE ELECTRICAL CONDUCTIVITY OF CELLULOSE-BASED MATERIALS OR OTHER IMPREGNABLE MATERIALS

Robert Bjorklund, Linköping; Hans Gustavsson, Västerås; Ingemar Lundström, Linköping, and Bertil Nygren, Västerås, all of Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 20, 1983, Ser. No. 505,856

Claims priority, application Sweden, Jun. 22, 1982, 8203863; Feb. 1, 1983, 8300529

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—121 **10 Claims**

1. A method of increasing the electrical conductivity of a solid, impregnable material which comprises the steps of

(1) providing a chemical compound containing a metal ion which is capable of changing its valence in said solid, impregnable material, said chemical compound being capable, during the polymerization of a pyrrole compound selected from the group consisting of pyrrole and N-methylpyrrole and mixtures thereof, of providing the produced polymer with a higher electrical conductivity than that of said solid, impregnable material,

(2) adding a pyrrole compound selected from the group consisting of pyrrole and N-methylpyrrole mixtures thereof to said solid, impregnable material from step (1), and

(3) allowing said pyrrole compound in the solid, impregnable material from step (2) to polymerize.

4,521,451

ENCAPSULATED MAGNETIC RECORDING DISK

Jerome M. Eldridge, Saratoga, and Andrew M. Homola, Morgan Hill, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1983, Ser. No. 538,029

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—130 **5 Claims**

1. A process for preparing a magnetic recording member comprising the steps of

preparing a liquid mixture containing an organic solvent, magnetic particles and one or more organometallic compounds, at least one of the organometallic compounds containing silicon,

applying said liquid mixture to a nonmagnetic thermally stable substrate,

heating said applied mixture to a temperature sufficient to form a melted glass material from the organometallic compound,

and cooling said melted glass material to heremetically encapsulate said magnetic particles.

4,521,452

GEL-FORMING COMPOSITIONS AND THE USE THEREOF

Ronald E. Highsmith, 28 E. Austin St., Skaneteles, N.Y. 13152

Continuation-in-part of Ser. No. 88,126, Oct. 25, 1979, abandoned. This application Feb. 26, 1981, Ser. No. 238,489

Int. Cl.³ B05C *1/16;* **B05D** *5/10*

U.S. Cl. 427—136 **28 Claims**

1. A uniform dispersion of a water soluble acrylamide polymer or copolymer useful for reducing or eliminating the flow of water through surfaces and earthen formations, having a molecular weight of from about 10^2 to about 10^7 in the water insoluble reaction product of a water soluble aldehyde of the formula

$$(OHC)_aR_b$$

wherein

(a) R is selected from the group consisting of H, aliphatic, and substituted aliphatic and arylaliphatic wherein the aryl group is not adjacent an OHC group,

(b) a is an integer of 1 or more, and

(c) b is 0 or 1, with the proviso that

(d) a is 1 when R is H and

(e) when b is 0, a is 2

with a water soluble primary amine of the formula

$$(H_2N)_cR'_d$$

wherein

(a) R′ is selected from the group consisting of H, aliphatic and substituted aliphatic and arylaliphatic wherein the aryl group is not adjacent an H_2N group,

(b) c is an integer of 1 or more, and

(c) d is 0 or 1, with the proviso that

(d) c is 1 when R′ is H, and

(e) when d is 0, c is 2,

which polymer or copolymer, aldehyde and amine components are present in adequate proportions to form a polymeric gel.

26. A method of preventing water permeation of a porous

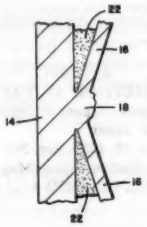
structural material which comprises applying to said structural material a dispersion as described in claim 1 and allowing said dispersion to react to form a polymeric gel.

4,521,453

HEATING/COOLING COIL SEALING

Kieran Mulcahy, Kildare, Ireland, assignor to Loctite (Ireland) Ltd., Dublin, Ireland

Filed Jan. 27, 1984, Ser. No. 574,500
Int. Cl.³ B32B 35/00; B05D 3/02
U.S. Cl. 427—140 10 Claims



1. A method of sealing a porosities in a corroded heating or cooling jacket of a reactor vessel, the method comprising:
(a) draining the heating or cooling fluid from said jacket;
(b) washing and drying the interior of said jacket;
(c) filling the jacket with a curable liquid sealant composition under pressure sufficient to cause the composition to permeate the porous areas in the jacket, but insufficient to burst the jacket, said composition being curable at temperatures between about 75° C. and 100° C. and having viscosity and surface tension properties which permit the jacket porous areas to be penetrated at pressures below the burst strength of the jacket;
(d) draining excess sealant from the jacket; and
(e) heating the jacket to or above the cure temperature of the composition and maintaining that temperature for sufficient time to ensure total polymerization of the reactive liquid.

4,521,454

METHOD OF PRODUCING HEAT-REFLECTING GLASS PLATE BY COATING WITH TITANIUM OXIDE FILM

Takayoshi Kandachi; Seiki Okino; Toshiharu Yanai, and Katsuto Tanaka, all of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Feb. 6, 1984, Ser. No. 577,379
Claims priority, application Japan, Feb. 12, 1983, 58-20563
Int. Cl.³ B05D 5/06, 3/02
U.S. Cl. 427—168 4 Claims

1. A method of coating a glass plate surface with a titanium oxide film to produce a heat-reflecting glass plate, the method having the step of spraying a solution of a thermally decomposable organic compound of titanium in an organic solvent onto a surface of a glass plate which is at such an elevated temperature that said compound in the sprayed solution decomposes on the glass plate surface to form titanium oxide,

characterized in that said compound is a chelate compound of titanium formed by coordination of two chelate ligands, which are selected from the group consisting of acetylacetone and ethyl acetoacetate, and two nonchelate ligands, which are a polyhydric alcohol, to a titanium atom.

4,521,455

PROCESS AND EQUIPMENT FOR THE PRODUCTION OF ALLOYED COPPER WIRE ROD BY CONTINUOUS CASTING

Sipos Domokos, Budapest, Hungary, assignor to Csepel Muvek Femmuve, Csepel, Hungary

Filed Jan. 20, 1983, Ser. No. 459,415
Claims priority, application Hungary, Feb. 23, 1982, 536/82
Int. Cl.³ B05D 3/12; B05C 3/02
U.S. Cl. 427—178 9 Claims

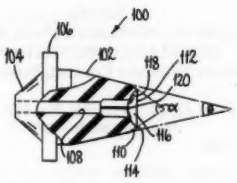
1. A process for the continuous casting of a copper alloy wire rod comprising the steps of simultaneously:
(a) charging a continuous flow of molten pure copper into a crucible;
(b) forming with said pure copper in said crucible a molten copper alloy by a continuously loading into said crucible alloying material for admixture with said pure copper;
(c) passing a core-rod of said alloy through said crucible at a defined casting speed whereby said molten alloy crystalizes on the surface of said core-rod, and;
(d) regulating the rate at whch said alloying material is loaded into said crucible in correspondence to the casting speed of said rod to maintain said molten alloy at a given proportion of pure copper and alloying material, and
thereafter working said crystallized rod to form said wire rod.

4,521,456

APPLICATOR NOZZLE

Raymond Hanson, Rearsby, England, assignor to USM Corporation, Farmington, Conn.

Filed Aug. 22, 1983, Ser. No. 525,122
Claims priority, application United Kingdom, Aug. 20, 1982, 8224033
Int. Cl.³ B05B 11/00
U.S. Cl. 427—207.1 3 Claims



1. A method of applying a band of liquid adhesive composition to a surface of a workpiece using a frusto-conical applicator nozzle having an orifice with a semi-spherical depression therein and a circular lip therearound, comprising:

supplying liquid composition to the orifice so that the composition flows through the orifice providing a reservoir of composition in the semi-spherical depression, with the frusto-conical applicator nozzle tilted with respect to the work bringing part of the circular lip and the surface of the workpiece substantially into contact so that the reservoir of composition forms a pool on the surface of the workpiece,

causing the flexible applicator portion to flex so that the applicator portion is deformed by contact with the workpiece surface, and

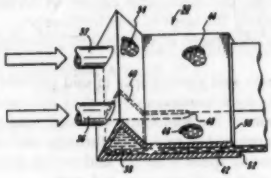
bringing about relative movement between the applicator nozzle and workpiece so that composition from the pool is spread in a band on the surface by the applicator portion, the pool preceding the part of the lip which is substantially in contact with the surface of the workpiece considering motion of the applicator relative to the workpiece.

4,521,457

SIMULTANEOUS FORMATION AND DEPOSITION OF MULTIPLE RIBBON-LIKE STREAMS

Philip P. Russell, El Cerrito, Calif.; Tyan-Faung Niu, Endwell, N.Y., and Frederic A. Holland, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 420,997
Int. Cl.³ B05D *5/00*
U.S. Cl. 427—286 **9 Claims**



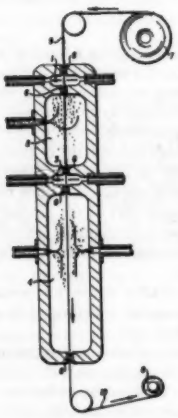
1. A process for applying to a surface of a support member at least one ribbon-like stream of a first coating composition side-by-side to and in edge contact with at least one second ribbon-like stream of a second coating composition comprising providing a source for said ribbon-like streams, establishing relative motion between said surface of said support member and said source of said ribbon-like streams, simultaneously constraining and forming said ribbon-like streams parallel to, side-by-side to and spaced from each other, contacting adjacent edges of said ribbon-like streams prior to applying said ribbon-like streams to said surface of said support member, and continuously applying said ribbon-like streams to said surface of said support member whereby said ribbon-like streams extend in the direction of relative movement of said surface of said support member and said source of said ribbon-like streams to form a continuous unitary layer having a boundary between said side-by-side ribbon-like streams on said surface of said support member.

4,521,458

PROCESS FOR COATING MATERIAL WITH WATER RESISTANT COMPOSITION

Richard C. Nelson, 31 Sunrise Crescent, Pointe Claire, Quebec, Canada

Filed Apr. 1, 1983, Ser. No. 481,300
Int. Cl.³ B05D *3/00*
U.S. Cl. 427—294 **9 Claims**



1. A continous process for coating a porous fabric sheet in a number of enclosed chambers not exposed to air, comprising the steps of:

linearly feeding the sheet through a first slit into an enclosed preparation chamber,

applying hot volatile liquid to the sheet in the preparation chamber,

feeding the sheet through a second slit into an enclosed vacuum chamber to remove moisture, air and other impurities and remaining volatile fluids from the sheet,

linearly feeding the sheet through a third slit into an enclosed coating chamber,

applying a liquid coating to the sheet in the coating chamber,

feeding the sheet through a fourth slit into an enclosed further processing chamber to dry and cure the coating on the sheet, and

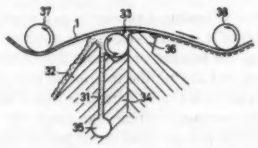
leaving the further processing chamber by a fifth slit.

4,521,459

COATING METHOD AND APPARATUS

Hideo Takeda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 19, 1983, Ser. No. 495,929
Claims priority, application Japan, May 19, 1982, 57-83236
Int. Cl.³ B05D *3/12*
U.S. Cl. 427—359 **10 Claims**



4. Apparatus of the extruder type for coating a web with a coating solution comprising: a coating solution supplying extruder outlet at the upper portion of a supply slot, a coil bar disposed at the rear of and adjacent to the supply slot and a smoother arranged at the rear of the coil bar and adjacent to the coil bar, wherein immediately after a coating solution is applied to a web which is continuously run surplus coating solution is scraped off and the web is subjected to smoothing by the smoother directly without undergoing a gaseous phase.

5. The apparatus of claim **4** further comprising a holder for said coil bar, one wall of said holder forming a wall of said supply slot.

4,521,460

AQUEOUS N-METHYLOLHYDRAZIDE-CONTAINING POLYMER DISPERSION

Shmuel Dabi, 218 N. 2nd St., Highland Park, N.J. 08904; Peter Loewrigkeit, 498 Vance Ave., Wyckoff, N.J. 07481, and Kenneth A. Van Dyk, 6 Fox Trail, Deertrail Lake, Stockholm, N.J. 07460

Filed Jun. 10, 1983, Ser. No. 503,336
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—385.5 **18 Claims**

1. A stable aqueous dispersion of a room temperature curing polymer effective for forming films resistant to water and organic solvents, said polymer being a water-dispersible vinyl addition polymer containing pendant N-methylolhydrazide groups effective to cause the polymer to undergo self-condensation, cross-linking, hardening and curing in situ on a substrate when said dispersion is applied to the substrate and dried at ambient temperatures, said dispersion being free of interfering groups which would prematurely react with the pendant N-methylolhydrazide groups and/or interfere with the self-condensation, cross-linking, hardening and curing of the dispersion when applied to a substrate and dried at ambient tem-

peratures, said pendant N-methylolhydrazide groups being present in an amount such that premature self-condensation and cross-linking do not take place in the dispersion.

11. A method of preparing a stable aqueous dispersion of a room temperature curing polymer effective for forming films resistant to water and organic solvents comprising: forming a reaction mixture of formaldehyde and an aqueous dispersion of a precursor water-dispersible vinyl addition polymer containing a proportion of pendant hydrazide groups which, when N-methylolated, is effective to cause the polymer to undergo self-condensation, cross-linking, hardening and curing in situ on a substrate when said dispersion is applied to the substrate and dried at ambient temperatures, the formaldehyde being present in amount to N-methylolate said proportion of pendant hydrazide groups, said reaction mixture being free of interfering groups which would prematurely react with the pendant hydrazide groups and/or interfere with the self-condensation, cross-linking, hardening and curing of the dispersion, said pendant hydrazide groups being present in an amount such that premature self-condensation and cross-linking do not take place in the reaction mixture.

4,521,461
SILOXANE-POLYESTER COMPOSITIONS

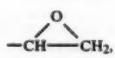
James McVie, and Derek W. Butler, both of Barry, Wales, assignors to Dow Corning Limited, Barry, Wales

Filed Apr. 25, 1984, Ser. No. 603,796
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—387 **5 Claims**

1. A composition which comprises (1) a siloxane-polyester copolymer resin having an average of at least two ≡SiOM and/or ≡COH groups per molecule, wherein M represents H or an alkyl group having from 1 to 4 carbon atoms, (2) one or more organic solvents for the siloxane-polyester copolymer (3) a silane of the general formula

$$ZSi(OY)_{3-a}^{X_a}$$

wherein Z represents an organic group composed of carbon, hydrogen and oxygen having therein at least one group of the formula



X represents a methyl group or a phenyl group, Y represents an alkyl or an alkoxyalkyl group having less than 5 carbon atoms and a has a value of 0 or 1, and (4) a titanium chelate which is a dialkoxytitanium bis-(acetylacetonate), a dialkoxytitanium bis-(ethylacetoacetate) or mixtures thereof.

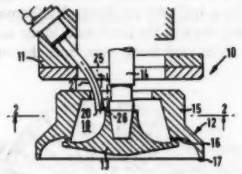
5. A process for coating a substrate which comprises applying to a substrate a composition as claimed in claim 1 and thereafter curing the applied composition.

4,521,462
ROTARY ATOMIZER FOR COATING WORKPIECES WITH A FINE LAYER OF LIQUID MATERIAL, AND A METHOD OF OPERATING THE SAID ATOMIZER

Kenneth R. Smythe, Farnborough, United Kingdom, assignor to Sale Tilney Technology Plc., Weybridge, United Kingdom

Filed Jul. 30, 1984, Ser. No. 635,619
Claims priority, application United Kingdom, Aug. 2, 1983, 8320827
Int. Cl.³ B05D *1/02*
U.S. Cl. 427—421 **9 Claims**

1. A rotary atomizer for coating workpieces with a fine and even layer of liquid coating material, comprising an atomizing device having a discharge edge, means for rotating said atomizing device, a liquid feed tube connectible to a source of coatng liquid and terminatng in an outlet within said atomizing device, and means for controlling the rate of flow of said liquid in the feed tube such that the flow is intermittent and produces drops at said outlet, characterised in that there is provided a gas or air supply tube having an outlet disposed adjacent the outlet of the liquid feed tube within the atomizing device and connectible to a source of pressurized gas or air, the relative

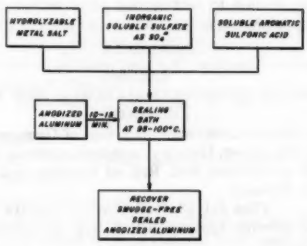


positions of said outlets being such that in use a regulated stream of gas or air is directed at or adjacent the liquid outlet so as to break up drops of said liquid appearing at the outlet into smaller droplets and deflect them towards the internal wall of the said atomizing device upstream of said discharge edge.

4,521,463
ONE STEP SEALING PROCESS

John H. Powers, Lower Burrell, and Edward G. Remaley, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 18, 1982, Ser. No. 409,072
Int. Cl.³ B05D *1/18*
U.S. Cl. 427—435 **16 Claims**



1. In a process for sealing anodized aluminum without necessitating an additional desmudging step to remove smudge formed in the sealing process, the improvement comprising immersing the anodized aluminum for 10 to 15 minutes in a sealing bath maintained at a temperature of 95 to 100° C. and consisting essentially of from 2 to 8 grams per liter of a hydrolyzable metal salt selected from the group consisting of acetate or sulfate salts of nickel, cobalt, aluminum, copper, lead, zinc and alkali metals; from 0.5 to 1.5 grams per liter of soluble inorganic sulfate as $SO_4^=$; and from 0.25 to 1.5 grams per liter of a soluble salt of a formaldehyde condensation of an aromatic sulfonic acid.

4,521,464
DECORATIVE PLATE APPARATUS

G. Paul Chapman, Marietta, Ga., assignor to Decorative Designs, Inc., Atlanta, Ga.

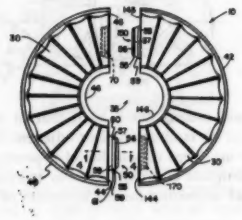
Filed Sep. 14, 1983, Ser. No. 531,954
Int. Cl.³ B32B *3/00, 3/02*
U.S. Cl. 428—33 **5 Claims**

1. A decorative plate apparatus, comprising:

a first plate section having a substantially flat back side and an inner surface comprising two planar sections separated by an arcuate section, wherein one of said two planar sections includes an integrally formed male extension

projecting outwardly from said inner surface and downwardly from said back side, and the other of said two planar sections includes an integrally formed female receptacle protruding inwardly of said inner surface and downwardly of said back side; and

a second plate section having a substantially flat back side and an inner surface comprising two planar sections separated by an arcuate section, wherein one of said two planar sections includes an integrally formed male extension projecting outwardly from said inner surface and downwardly from said back side, and the other of said two



planar sections includes an integrally formed female receptacle protruding inwardly of said inner surface and downwardly from said back side,

whereby twisting said plate sections about an axis perpendicular to said inner surfaces engages said male extension of said first plate section with said female receptacle of said second plate section, and further engages said male extension of said second plate section with said female receptacle of said first plate section, thereby securing said first plate section to said second plate section to provide a unitary plate.

4,521,465

COATED COMPOSITE MATERIAL FOR LINING PASSAGES

Walter Schröer, Leverkusen, Fed. Rep. of Germany, and Gyula Wlasitsch, Gyoer, Hungary, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany and Graboplast, Gyoer, Hungary

Filed Jul. 18, 1983, Ser. No. 514,918

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1982, 3227679

Int. Cl.³ B32B *31/00*

U.S. Cl. 428—35 **18 Claims**

1. A composite material laminate comprising:

(i) a textile layer

(ii) a gas and water-impermeable-plastic film comprising

(ii-a) a layer of filler-containing polyurethane-urea coating composition derived from blocked NCO prepolymers having a functionality of at least 2.10 and aliphatic and/or cycloaliphatic polyamines having an NCO/NH_2 ratio of from 1.3:1 to 0.95:1 and containing about 5 to about 40% relative to the weight of the composition of inorganic fillers and

(ii-b) a layer of a substantially linear, thermoplastic polyurethane-urea coating derived from a linear NCO-prepolymer having a functionality of from 1.95 to 2.06 and aliphatic and/or cycloaliphatic polyamines having an NCO/NH_2 ratio of from 1.30:1 to 0.95:1 said (ii-a) and said (ii-b) being joined together undetachably, said (ii-a) facing said (i) and said (ii-b) being remote from said (i), said (ii-a) and said (ii-b) being further characterized in that they are formed by coating the corresponding high solid systems comprising blocked NCO-prepolymers and aliphatic or cycloaliphatic polyamines, in the direct or transfer coating process.

4,521,466

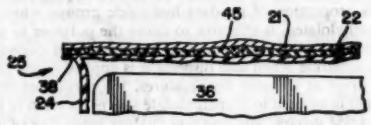
CELLULAR SEAL COATING

Leonard A. White, Gurnee, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 12, 1983, Ser. No. 530,891

Int. Cl.³ B32B *3/12, 5/18*

U.S. Cl. 428—35 **19 Claims**



1. A solventless method for providing seal coatings, comprising:

formulating a bonding composition, including finely divided, electrostatically chargeable bonding agent particles that are activatable to a state at which the bonding agent particles adhere preassembly members together, said bonding agent composition further including a blowing agent that develops gas bubbles when the bonding composition is activated to said state at which the bonding agent particles adhere preassembly members together;

electrostatically depositing said bonding composition onto a preassembly member; and

activating said deposited bonding composition in order to seal said preassembly member with a cellular bond, said activating step including activating said blowing agent within the bonding composition to thereby impart cellular properties to said cellular bond.

15. An article having a seal coating, comprising:

an assembly member having a panel that includes a seal coating thereon, said seal coating being a cellular bond that includes a bonding agent having gaseous cells interspersed therewithin; and

said cellular bond is formed from a bonding composition including bonding agent particles and a blowing agent that develops gas bubbles when the bonding composition is activated to a state at which said bonding agent particles form the seal coating, said bonding agent particles being electrostatically chargeable.

4,521,467

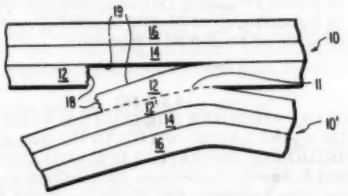
ULTRASONICALLY-SEALABLE PEELABLE SEAL

Kenneth R. Berger, Grapevine, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Dec. 12, 1983, Ser. No. 560,120

Int. Cl.³ B32B *27/08;* **B65D** *73/00*

U.S. Cl. 428—35 **17 Claims**



1. A package seal which is ultrasonically-sealable and maintains a peelable seal feature, the peelable seal comprising:

(a) a sealing layer of resin material which is ultrasonically-sealable, but is not readily heat-sealable,

(b) a backing layer for the sealing layer, the backing layer being of a higher melting point resin than the sealing layer, the interlayer adhesion between the backing layer and the

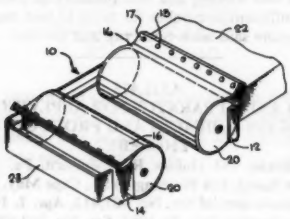
sealing layer being below the strength required to break the sealing layer.

4,521,468

DEFORMABLE PAD FOR TREE CLAMPING JAWS

Richard W. Brandt, Yuba City, Calif., assignor to Orchard Machinery Corporation, Yuba City, Calif.

Filed Jan. 19, 1984, Ser. No. 572,675
Int. Cl.³ B32B *1/02*
U.S. Cl. 428—35 15 Claims



1. A deformable pad for clamping jaws of a tree shaking machine comprising,

a bark protective, resilient container means for cushioning a tree mounted in a jaw support of a tree shaking machine, said container means having a fitting disposed therein forming an exterior porthole opening to a central cavity, said central cavity more than 90% filled with high abrasion resistant polymer rods impregnated with a dry, high-melting temperature lubricant, said rods having dimensions in the range of one to seven millimeters.

4,521,469

CASING FOR ELECTRONIC COMPONENTS

Sheldon H. Butt, Godfrey, Ill.; Edward F. Smith, III, Madison, and F. Dennis Gyurina, West Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 443,793, Nov. 22, 1982,. This application May 31, 1984, Ser. No. 615,606
Int. Cl.³ B65D *65/28*
U.S. Cl. 428—35 5 Claims

1. A casing adapted to contain an electrical or electronic component, comprising:

a copper or copper alloy leadframe;

an adhesion primer on the surface of said leadframe, said adhesion primer comprising a substantially uniform glassy and substantially pore-free phosphate coating; and

a plastic material comprising an epoxide resin bonded to said leadframe to form said casing, said resin forming a strong adhesive bond to said leadframe, said epoxide resin containing a mold release agent.

4,521,470

DIMENSIONALLY HEAT RECOVERABLE ARTICLE

Noel M. M. Overbergh, Bertem; Jos Doucet, Kessel-Lo, and Jan Vansant, Heverlee, all of Belgium, assignors to N.V. Raychem S. A., Belgium

Filed Jul. 27, 1983, Ser. No. 517,542
Claims priority, application United Kingdom, Jul. 26, 1982, 8221539
Int. Cl.³ B29C *27/00*
U.S. Cl. 428—36 20 Claims

1. An article for enclosing at least part of an object, comprising:

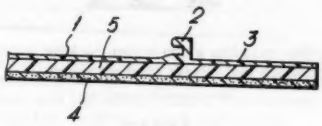
a dimensionally heat-recoverable cover adapted to be recovered about the object;

a layer of a heat-softenable adhesive adapted to contact the object;

an intermediate layer of a thermoplastic polymeric material located between the cover and the heat-softenable adhesive, the polymeric material bonding to both the cover and adhesive during recovery of the cover, which material has a melting or softening point that is higher than that of the heat-softenable adhesive and has a thickness that is greater than that of the heat-softenable adhesive.

15. A method of enclosing at least part of an object, comprising the steps of:

(a) installing around the object a layer of a heat-softenable adhesive;



(b) installing over the heat-softenable adhesive a layer of a thermoplastic polymeric material having a thickness greater and a melting or softening point higher than those of the heat-softenable adhesive;

(c) installing over the thermoplastic material a dimensionally heat-recoverable cover; and

(d) causing recovery of the cover, and softening of the heat-softenable adhesive and of the thermoplastic polymeric material such that the polymeric material bonds with the cover and the adhesive.

4,521,471

PROCESSES AND ARTICLES FOR REMOVING TYPEWRITER INKS

Duane F. Merrill, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Sep. 15, 1982, Ser. No. 418,338
Int. Cl.³ A61F *13/02*
U.S. Cl. 428—40 9 Claims

1. An article for removing vertically cohesive ink from a substrate comprising:

(a) a backing material and

(b) a silicone pressure sensitive adhesive composition cured to one side of said backing material, said pressure sensitive adhesive composition comprising the co-condensation reaction product of a mixture containing 100 parts by weight of a trimethyl chain-stopped MQ resin having an M to Q ratio ranging from approximately 0.5 to 1.0:1, and 44–57 parts by weight of a dimethylpolysiloxane gum having a penetration ranging from approximately 500 to 1,200 millimeters at 25° C. and wherein the adhesive has a greater affinity for the vertically cohesive ink than for the substrate and has a greater internal cohesion than external adhesion.

4,521,472

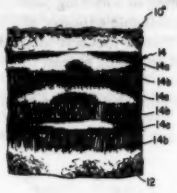
FABRIC AND METHOD OF MANUFACTURE USING SELVAGE BANDS

Kenneth A. Gold, 29 Wildwood Gardens, Port Washington, N.Y. 11050

Continuation of Ser. No. 119,129, Feb. 6, 1980, Pat. No. 4,341,829. This application Jun. 22, 1982, Ser. No. 390,960
The portion of the term of this patent subsequent to Jul. 27, 1999, has been disclaimed.
Int. Cl.³ B32B *29/00*
U.S. Cl. 428—53 7 Claims

1. A non-woven fabric including, as a primary component, a

fringed selvage band of the type obtained as a by-product of the manufacture of certain-woven fabrics, said non-woven



fabric further including a non-woven backing material to the surface of which said selvage band is secured.

4,521,473

CARPET WITH FUSION-CUT THROUGH BORE AND ITS MANUFACTURE METHOD

Takao Sakamoto, and Tadafumi Abe, both of Akishima, Japan, assignors to Tachikawa Spring Co., Ltd., Japan

Filed Oct. 21, 1983, Ser. No. 544,413
Int. Cl.³ B32B *3/10*
U.S. Cl. 428—82 **9 Claims**

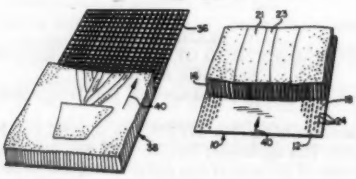
1. A carpet comprising:
a napped portion including a thermally weldable base cloth provided on a rear surface of the napped portion;
a through bore having a desired shape and formed at a suitable position in the carpet, said through bore being defined by a wall which establishes a circumferential edge portion of said napped portion adjacent said wall; and
a hem member consisting essentially of a thermally weldable synthetic resin film having first and second portions integrally adhered to said base cloth along said wall of said through bore and covering said circumferential edge portion of said napped portion adjacent to said wall of said through bore, respectively.

4,521,474

CARRIER AND METHOD FOR PROVIDING YARN FOR LATCH HOOK RUG KITS AND THE LIKE

Edward Berman, 1080 South Downing St., Seaside, Oreg. 97138

Division of Ser. No. 091,550, Nov. 5, 1979, abandoned. This application Nov. 28, 1980, Ser. No. 211,309
Int. Cl.³ B32B *3/02*
U.S. Cl. 428—93 **6 Claims**



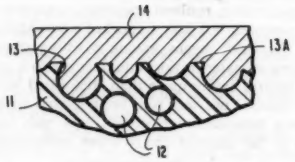
1. A kit including material for assembling a handmade rug and the like, comprising:
(a) mesh backing fabric for receiving a plurality of pieces of yarn to be tied thereto in making a latch hook rug and the like;
(b) a carrier consisting essentially of a pliable sheet including means defining a plurality of perforations therein for removably holding pieces of yarn; and
(c) a plurality of pieces of yarn, each of said pieces of yarn being bent into a "U" shape and having each end thereof extending through a respective one of said perforations, said perforations being sufficiently small to frictionally retain said ends, thereby removably holding said pieces of yarn in said carrier, and said plurality of pieces of yarn being sufficient in number for tying to said mesh backing to complete said latch hook rug and the like.

4,521,475

METHOD AND APPARATUS FOR APPLYING METAL CLADDING ON SURFACES AND PRODUCTS FORMED THEREBY

Louis M. Riccio, 161 Hollow Rd., Malvern, Pa. 19355, and Alexander Bosna, 814 Washington St., Cape May, N.J. 08204

Continuation-in-part of Ser. No. 481,412, Apr. 1, 1983,. This application Dec. 20, 1983, Ser. No. 563,430
Int. Cl.³ B32B *3/06, 3/20*
U.S. Cl. 428—142 **24 Claims**



1. In a marine surface protected from marine growth by an external layer of a thermally sprayed metal selected from copper and copper based alloys, the improvement wherein a layer of an adhesive resin is between said surface and said external layer of metal, a plurality of fractured inorganic hollow spheres in the interface between said resin and said external metal layer forming undercuts, nooks and crannies, said external layer of metal being constituted by a layer of solidified thermally sprayed metal particles sprayed in a molten state and filling and interlocking with said undercuts, nooks and crannies.

3. The invention defined in claim 1 including a first metal layer with metal particles selected from copper and copper-nickel alloys embedded in said adhesive layer and said layer of thermally sprayed metal particles is sprayed in a molten state at a high velocity on said first metal layer.

7. The invention defined in claim 3 wherein said first metal layer and said thermally sprayed layer have a combined thickness of at least 3 mils.

8. The invention defined in claim 7 wherein said first metal layer is thinner than said thermally sprayed metal layer.

4,521,476

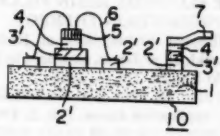
HYBRID INTEGRATED CIRCUIT AND PREPARATION THEREOF

Shinichiro Asai; Kazuo Katoh, and Tatsuo Nakano, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,589
Claims priority, application Japan, Aug. 19, 1982, 57-142726
Int. Cl.³ B32B *3/00;* C23B *1/08;* H01L *27/10*
U.S. Cl. 428—209 **7 Claims**

1. A hybrid integrated circuit, comprising:
an aluminum-copper clad foil on an insulating layer, wherein the upper metal foil of said aluminum-copper clad foil is etched into a predetermined circuit pattern by an etching agent which selectivity dissolves only the metal of said

upper metal foil and then the lower metal foil is etched into a predetermined circuit pattern by an etching agent which selectivity dissolves only the metal of said lower metal foil, thereby forming a device having an aluminum



circuit pattern and a copper circuit pattern, a semiconductor element connected to said aluminum circuit through an aluminum wire or a gold wire and a circuit element soldered to said copper circuit.

4,521,477

MULTILAYER FIBRE MAT AND PROCESS FOR ITS PRODUCTION

Günter H. Kiss, Gustav-Freytag-Strasse 7, D-1000 Berlin 33, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,900

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139854; Sep. 6, 1982, 3233385

Int. Cl.³ B29J *5/04;* **B32B** *31/12, 31/20;* **D04H** *1/58*

U.S. Cl. 428—282 **17 Claims**

1. A multilayer fiber mat for the eventual production of mouldings in a die by later applying pressure to the fiber mat while obtaining moulding temperature in a temperature range of from about 170° to 210° C. to form the moulding, the mat comprising:

two cover layers formed of woody fibrous material and a proportion of thermosetting synthetic resin which can be pressed in the temperature range of 170° to 210° C., and

a central layer sandwiched between the cover layers which is formed of woody fibrous material containing a thermoplastic bonding agent additive the resistance to oxidation of which is inadequate within said temperature range;

said two cover layers containing about 10 to 30% of the total fibrous material of the mat with the central layer containing the remainder thereof, and

the relatively high proportion of thermosetting resin in said cover layers compared to said central layer preventing deterioration of the thermoplastic bonding agent in said central layer during moulding,

so that moulded mats of high quality can be produced notwithstanding the inclusion of said oxidation-sensitive thermoplastic bonding agent additive in the central layer.

11. A process for the production of the multilayer mat of claim 1 comprising the steps of pouring fibrous mat material in layers onto a conveyor belt and levelling and compacting the material prior to demoulding, the improvement comprising first furnishing fibrous material intended for all three layers together with a thermoplastic bonding agent additive; then, prior to applying the fibrous material to a conveyor belt, branching off a quantity of the fibrous material intended for the cover layers from the total fibre flow while providing the branched-off fibrous material with the thermosetting synthetic resin; and supplying the component fibre quantities for the individual layers to a conveyor belt in corresponding sequence.

4,521,478

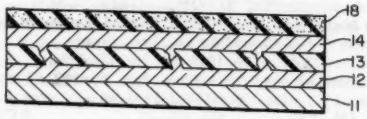
IN SITU ROOFING COMPOSITE AND METHOD

John P. Hageman, 42 Susan Dr., Closter, N.J. 07624

Filed Aug. 20, 1984, Ser. No. 642,576

Int. Cl.³ B32B *3/10, 5/02, 5/18, 11/02*

U.S. Cl. 428—287 **18 Claims**



1. A built-up, in situ roofing composite, comprising:

a first layer of water-proofing ingredients applied to a roof substrate, said ingredients selected from a group consisting of asphalt, modified asphalt and coal tar;

at least a single ply of non-woven polyester sheeting overlaying said first layer;

a second layer of water-proofing ingredients applied over said polyester, said second layer flowing through said polyester and melding with said first layer to form a built-up composite membrane which is affixed to said substrate; and

an insulating, heat-resistant layer of material disposed over said built-up composite membrane forming a roofing composite that is substantially split-resistant.

4,521,479

SURFACE TREATMENT FOR TACK REDUCTION OF ELASTOMER SURFACES

Ralph A. Maglio, Wadsworth, and John W. Fieldhouse, Mogadore, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 26, 1983, Ser. No. 498,380

Int. Cl.³ B32B *23/04, 25/04*

U.S. Cl. 428—326 **8 Claims**

1. A method of reducing the surface tack of an EPDM elastomer which comprises coating the surfaces of the EPDM elastomer with particulate cellulose.

4,521,480

MAGNETIC RECORDING MEDIA OF THE HIGH RECORDING DENSITY TYPE COMPRISING BOTH TITANIUM MONOXIDE AND MAGNETIC ALLOY POWDERS IN A MAGNETIC LAYER

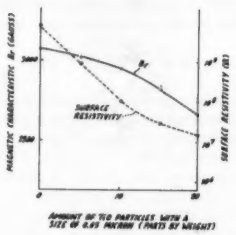
Kuniharu Fujiki, Mito, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Aug. 9, 1983, Ser. No. 521,578

Claims priority, application Japan, Aug. 10, 1982, 57-137890

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—328 **6 Claims**



1. A magnetic recording medium of the high recording density type comprising a support and a magnetic recording layer formed on at least one side of said support, said magnetic

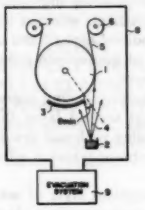
recording layer comprising a dispersion in a binder, of magnetic alloy particles and TiO particles, wherein said TiO particles are present in an amount from 0.1 to 20 weight percent of said magnetic alloy particles and have an average size of from 0.01 to 5 microns.

4,521,481

MAGNETIC RECORDING MEDIUM

Makoto Nagao, and Akira Nahara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Sep. 26, 1983, Ser. No. 536,050
Claims priority, application Japan, Sep. 29, 1982, 57-170650
Int. Cl.³ G11B *5/64, 5/66*
U.S. Cl. 428—336 **5 Claims**



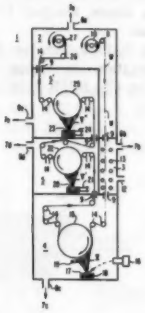
1. A magnetic recording medium comprising: a non-magnetic substrate and a least one layer of obliquely deposited magnetic crystals which contains, as a main constituent, a Co-Ni based alloy containing Cr in an amount within the range of 2 to 8 atom % and which is obliquely deposited on said non-magnetic substrate in such a manner that the minimum angle of incidence of a vapor stream of a magnetic material with respect to the line normal to said non-magnetic substrate is 45° or less to form a film on said substrate having a curved columnar structure.

4,521,482

MAGNETIC RECORDING MEDIUM

Yoshihiro Arai, and Akira Nahara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 364,273, Apr. 2, 1982, abandoned. This application Dec. 19, 1983, Ser. No. 563,014
Claims priority, application Japan, Apr. 2, 1982, 57-49884
Int. Cl.³ H01F *10/02;* **B05D** *5/12*
U.S. Cl. 428—336 **11 Claims**



1. A magnetic recording medium having a layer of an organic polymer formed on an oblique vapor deposited magnetic metal film and a layer of a higher aliphatic acid and/or an ester thereof being formed on said polymer layer, wherein both said organic polymer layer and said higher aliphatic acid and/or ester thereof layer are formed by vacuum deposition, ion plating, ion sputtering or plasma polymerization, and wherein said organic polymer layer has a thickness of about 10 to 250 Å and said layer of aliphatic acid and/or ester thereof has a thickness of about 20 to 400 Å.

4,521,483

VINYLIDENE FLUORIDE RESIN FILAMENT AND PRODUCTION THEREOF

Tohru Sasaki; Hiroyuki Endoh, both of Iwaki, and Seiichi Ohira, Kita-Ibaraki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1984, Ser. No. 573,684
Claims priority, application Japan, Feb. 2, 1983, 58-15783
Int. Cl.³ D02G *3/00;* **B32B** *23/00;* **B29F** *3/10*
U.S. Cl. 428—373 **16 Claims**

1. A composite fiber comprising at least a two layer structure of a sheath and a core, each layer comprising a vinylidene fluoride resin, the core portion having an inherent viscosity of at least 1.10 dl/g and the sheath portion having an apparent viscosity lower than that of the core portion, said composite fiber having an birefringence of at least 36.0×10^{-3}.

4,521,484

SELF-CRIMPING POLYAMIDE FILAMENTS

George T. C. Li, Ridgeway, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 7, 1984, Ser. No. 618,105
Int. Cl.³ D02G *3/00*
U.S. Cl. 428—374 **4 Claims**

1. A sheath-core bicomponent synthetic filament capable of forming a helical crimp upon relaxation consisting essentially of an oriented poly(hexamethylene adipamide) sheath comprising from 35% to 50% by weight of the filament and an eccentrically located ternary copolyamide core which consists essentially of at least about 60% by weight of hexamethylene adipamide units, from about 15% to 30% by weight of hexamethylene isophthalamide units and from about 5% to 10% by weight of hexamethylene terephthalamide units, the ratio of the weight percentages of the hexamethylene isophthalamide units to the hexamethylene terephthalamide units being from 1.5 to 6.0.

4,521,485

ELECTRICAL INSULATION

Stephen L. Tondre, Menlo Park, and Hans E. Lunk, Fremont, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 418,355, Sep. 15, 1982, abandoned. This application Sep. 27, 1983, Ser. No. 536,919
Int. Cl.³ B32B *15/00;* **H01B** *7/00*
U.S. Cl. 428—383 **18 Claims**

1. An insulated electrical article, comprising

(a) a conductor;

(b) a melt-shaped inner insulating layer comprising a first organic polymer component which is a cross-linked fluorocarbon polymer containing more than 10% by weight fluorine, and

(c) a melt-shaped outer insulating layer which contacts the inner insulating layer and which comprises a second organic polymer component which is a substantially linear aromatic polymer having a glass transition temperature of at least 100° C. and which comprises units of the formula

—Ar—Q—

wherein

Ar is a polyvalent aromatic radical and

Q is a radical of the formula

—O—

—S—

—SO_2—

—CO—

—NH.CO—

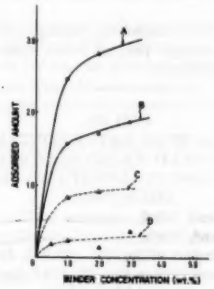
—COO— or

4,521,486

MAGNETIC RECORDING MEDIUM

Yoshinobu Ninomiya, Naruse; Masashi Somezawa, Sendai, and Akira Hashimoto, Tagajyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 8, 1982, Ser. No. 396,302
Claims priority, application Japan, Jul. 13, 1981, 56-109129
Int. Cl.³ G11B 5/68
U.S. Cl. 428—407 6 Claims



1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer formed thereon composed mainly of magnetic powder and a binder, said binder containing a binder component being adsorbed on a surface of said magnetic powder in an amount more than 1.5 mg per square meter of the surface area of said powder measured in 3 weight % solution in methyl ethyl ketone solvent, and said magnetic layer having a pigment volume concentration of said magnetic powder between 60 and 75%.

3. A magnetic recording medium according to claim 1, in which said binder component is polyurethane resin or polyurethane resin having a hydrophilic group in the molecule of said resins.

4,521,487

PARTICULATE POLYOLEFIN EXPANSION MOLDING MATERIAL

Tatsuyuki Mitsuno, and Masashi Yamamoto, both of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Sep. 21, 1984, Ser. No. 652,994
Claims priority, application Japan, Sep. 21, 1983, 58-175487
Int. Cl.³ C08J 9/16
U.S. Cl. 428—407 6 Claims

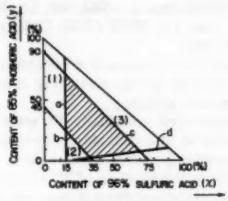
1. A particulate polyolefin expansion molding material comprising a particulate polyolefin having a bulk density of 0.45 g/cc or more and a mean particle size of 150 to 2,000μ, said particles having coated on the surface thereof at least one layer comprising a solid decomposable expanding agent, a binder selected from the group consisting of olefinic polymers, petroleum resins and polyalkylene glycols and a filler.

4,521,488

POLYACETAL RESIN COMPOSITION EXCELLENT IN HEAT STABILITY AND SURFACE PROCESSABILITY AND PROCESS FOR SURFACE TREATING SAME

Yoshihiro Hattori, Kawasaki; Takashi Watanabe, Ayase, and Kunio Maeda, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 251,936, Apr. 7, 1981, Pat. No. 4,464,435, which is a continuation-in-part of Ser. No. 86,534, Oct. 19, 1979, abandoned. This application Jan. 17, 1984, Ser. No. 571,677
Claims priority, application Japan, Oct. 25, 1978, 53-130479; Aug. 17, 1979, 54-104102
Int. Cl.³ B32B 15/08
U.S. Cl. 428—409 11 Claims



1. A process for roughening the surface of a molded product of a polyacetal resin composition excellent in heat stability and surface processability comprising (1) blending (a) about 100 parts by weight of polyacetal resin, (b) about 2 to about 35 parts by weight of a carbonate, phosphate or acetate of a metal belonging to Group II of the periodic table or a mixture thereof and (c) about 0.01 to about 20 parts by weight of a polymer, a copolymer or a mixture thereof of a compound selected from the group consisting of unsaturated polyester, alkyl ester of acrylic acid or methacrylic acid, amide of acrylic acid or methacrylic acid, triallyl cyanurate, diallyl phthalate, vinyl acetate and divinylbenzene; (2) molding the resulting polyacetal resin composition into the desired configuration; and (3) conditioning the resulting molded product by dipping said molded product in an aqueous solution containing sulfuric acid.

4,521,489

LOW TEMPERATURE CURE COATING SYSTEM SUITABLE FOR METAL AND PLASTIC SUBSTRATES

John W. Rehfuss; Louis S. Hazelwood; Martin B. Price, and Robert W. Zilke, Jr., all of Louisville, Ky., assignors to Reliance Universal, Inc., Louisville, Ky.

Continuation of Ser. No. 470,782, Mar. 1, 1983, abandoned, which is a continuation-in-part of Ser. No. 348,604, Feb. 12, 1982, abandoned. This application Jun. 13, 1984, Ser. No. 619,699
Int. Cl.³ B32B 27/36
U.S. Cl. 428—412 1 Claim

1. A metallic or plastic article having applied thereto a base coating, comprising a dried, non-acid catalyzed, thermoplastic polymer which has a glass transition temperature in the range of about 21° to 51° C. and a minimum film-forming temperature in the range of about 10°–55° C. and having applied over said base coating a top coating cured at temperatures below about 66° C., said top coating being formed from an aqueous coating composition consisting essentially of (a) about 52–78.5% by weight of an aqueous dispersion binder of polymerized ethylenically unsaturated monomers having a combined glass transition temperature in the range of about 26°–60° C., said binder being comprised of a copolymer of about 3–10% by weight of a hydroxy functional copolymerizable monomer, about 4–9%

by weight of an amide functional copolymerizable monomer, about 0–2.0% by weight of an acid monomer, and about 93 to 79%, by weight of other monomers copolymerizable therewith, wherein the polymeric dispersion is stable in a pH range of about 1.0–10 and reactable with a crosslinking system; (b) about 1.5–8% by weight of a surfactant mixture containing at least about 50% by weight based upon the total mixture of nonionic surfactants, and the amount of surfactant in the composition being sufficient to render the composition dispersion stable throughout the pH range of about 1.0 to 10; and (c) about 40% by weight of a crosslinking system formed from a mixture of alkoxy alkyl urea-formaldehyde and alkoxy alkyl melamine-formaldehyde crosslinking agents.

4,521,490

TWO-PART EPOXY COMPOSITION

Alphonsus V. Pocius, Maplewood, and William J. Schultz, Vadnais Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Aug. 11, 1983, Ser. No. 522,419

Int. Cl.³ B32B *15/08;* **C08L** *75/04*

U.S. Cl. 428—416 **17 Claims**

1. An epoxy resin composition comprising:

a. a curable epoxide group-containing compound having one or more oxirane groups,

b. in-situ polymerized, colloidally-dispersed, elastomeric particles insoluble in said epoxide group-containing compound, said elastomeric particles comprising a polymer having a glass transition temperature of 25° C. or less and is selected from polymers derived from at least one of (1) ethylenically-unsaturated group-containing monomers and (2) diisocyanates and coreactive difunctional compounds that are curable to elastomeric compounds, and

c. a poly(oxyhydrocarbolene)diamine compound as curing agent.

4,521,491

FLAME-RETARDED COPPER-CLAD LAMINATE

Masayuki Oizumi, Ohtsu; Masaharu Abe, Kobe, and Yasuo Fushiki, Takatsuki, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 326,359, Dec. 1, 1981, abandoned. This application Jan. 18, 1984, Ser. No. 572,126

Claims priority, application Japan, Dec. 2, 1980, 55-170450

Int. Cl.³ B32B *15/08*

U.S. Cl. 428—458 **12 Claims**

1. In a flame-retarded copper-clad laminate suitable for use as a printed circuit board comprising a plurality of cellulosic fiber paper substrate layers each impregnated with an unsaturated polyester resin and a copper cladding adhesively bonded to at least one side thereof, the improvement wherein the unsaturated polyester resin contains:

(a) 1 to 12% by weight of bromine attached to an aliphatic and/or alicyclic backbone component of said unsaturated polyester resin;

(b) 5 to 25% by weight of bromine attached to an aromatic backbone of said resin and/or attached to an aromatic flame retardant admixed with said unsaturated polyester resin; and

(c) the total bromine content not exceeding 30% by weight of the laminate.

4,521,492

LIGHT REFRACTIVE COATED PAPERBOARD

Robert L. Allen, Park Ridge, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Apr. 5, 1982, Ser. No. 365,538

Int. Cl.³ B32B *15/12, 29/04*

U.S. Cl. 428—464 **8 Claims**

5. A light refractive packaging material for packaging grease or oil-containing substances, said material comprising:

(a) a paperboard substrate;

(b) a first layer of a non-leafing silver colored ink printed on one surface of said paperboard substrate;

(c) a second layer of a highly pigmented white ink printed directly onto said first layer of said non-leafing silver colored ink; and

(d) said first and second ink layers combining to mask the appearance of grease or oil stains on said one surface of said paperboard substrate, which stains are the result of grease or oil permeating said paperboard substrate from the surface thereof opposite said one surface.

4,521,493

FIBER FILTER AND STABILIZER FORMULATION

Jay B. Class, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 12, 1984, Ser. No. 570,115

Int. Cl.³ C08G *93/00;* **C09J** *5/00;* **A24C** *5/50;* **C08L** *93/04*

U.S. Cl. 428—498 **14 Claims**

1. A resin-modified polymeric composition of an aqueous emulsion or dispersion of

(A) a component of at least one wholly or partly hydrogenated rosin ester esterified with glycerin or pentaerythritol, or a polyterpene resin component; said component having a molecular weight not exceeding about 2000 with a drop softening point of about 60° C.–95° C.; and

(B) a hardener component comprising at least one of an acetate or acrylate homopolymer, copolymer or terpolymer;

the ratio of (A)-to-(B) components falling within the range of about 5–30:95–70 weight percent solids upon substantial removal of water therefrom.

4,521,494

STYRENE-ACRYLIC LATEX CONTAINING A HETERO-UNSATURATED MONOMER AND PAPER-COATING COMPOSITIONS PRODUCED THEREFROM

Inder Mani, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 384,812, Jun. 3, 1982, abandoned. This application Oct. 19, 1983, Ser. No. 543,550

Int. Cl.³ C08L *33/02*

U.S. Cl. 428—514 **8 Claims**

1. A coated paper article in the form of a fibrous sheet coated on at least one surface with a paper-coating composition comprising a pigment, and an emulsion polymerized latex copolymer comprising (a) an ester of an ethylenically unsaturated carboxylic acid and a saturated alcohol, and (b) a hetero-unsaturated monomer selected from the group consisting of (1) an allyl acrylate or allyl methacrylate in an amount from about 0.05 to about 3.0 percent based on total monomer weight, or (2) a croytl acrylate or croytl methacrylate in an amount from about 0.20 to about 5.0 percent based on total monomer weight; said composition further characterized in that said pigment is present in an amount from about 99 to about 77 weight percent based on total dry solids.

4,521,495

PROCESS FOR COATING A WOODY SUBSTRATE AND PRODUCT

Kenneth G. Hahn, Jr., Hinckley, Ohio, assignor to SCM Corporation, New York, N.Y.

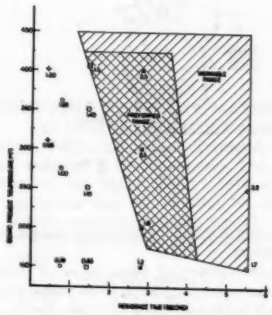
Continuation-in-part of Ser. No. 547,982, Nov. 2, 1983, abandoned. This application Jun. 25, 1984, Ser. No. 624,051

Int. Cl.³ B32B *21/04, 21/06*

U.S. Cl. 428—537.1 **5 Claims**

1. A process for applying a low viscosity aqueous coating to a woody substrate having uneven, decorative or patterned surfaces wherein the surface of the wood is flooded with an aqueous coating, the excess coating is stripped with an air knife and the residual coating of the substrate is cured by baking, which comprises:

(a) preheating the wood substrate to a temperature in the range of from about 225° F. to about 425° F. prior to application of a low viscosity aqueous coating
(b) flooding the surface of the substrate with the said coating;
(c) allowing the coating to remain in contact with the said preheated surface for a residence time period, from about



0.1 seconds, to about 10.0 seconds, sufficient to allow a partial coalescence of the coating in contact with the ridge area and to produce an adhered coating over the surface prior to removing the excess coating
(d) removing the excess coating by the direct action of an air knife
(e) curing the adhered coating to produce a cured film of substantially uniform depth.

4,521,496

STRESS RELIEVED METAL/CERAMIC ABRADABLE SEALS

Raymond V. Sara, 26446 Sweetbriar Dr., North Olmstead, Ohio 44070

Division of Ser. No. 171,830, Jul. 24, 1980, Pat. No. 4,379,812, which is a division of Ser. No. 973,553, Dec. 27, 1978, Pat. No. 4,243,169. This application Apr. 7, 1983, Ser. No. 482,993
Int. Cl.³ B22F *5/00, 7/04*
U.S. Cl. 423—551 **6 Claims**

1. A turbine engine seal structure comprising a multi-layer metal/ceramic abradable composite bonded to a deformable metal substrate, which is curved in one plane to a predetermined radius such that the thermal stresses of bonding said metal/ceramic composite to said substrate will cause said substrate to assume a desired radius after said bonding, with stiffeners added to said substrate after said bonding.

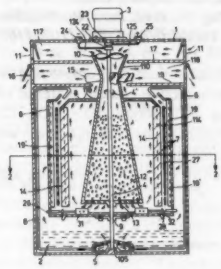
4,521,497

ELECTROCHEMICAL GENERATORS AND METHOD FOR THE OPERATION THEREOF

Pentti J. Tamminen, Espoo, Finland, assignor to LTH Associates, Ltd., Cambridge, Mass.

Filed May 18, 1984, Ser. No. 611,963
Int. Cl.³ H01M *2/00*
U.S. Cl. 429—27 **34 Claims**

1. An electrochemical generator comprising:
an anode electrode having at least one surface;
a cathode electrode having at least one surface, said electrodes being mounted with their respective surfaces being in substantially parallel planes and spaced from each other by a predetermined distance;
an electrolyte flowing between the surfaces of said electrodes; and
means for rotating said electrodes about an axis and adapted to cause a substantial centrifugal force to be applied to at



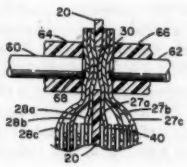
least one of said surfaces in a direction substantially perpendicular thereto.

4,521,498

THROUGH-THE-PARTITION INTERCELL CONNECTION AND METHOD

Tristan D. Juergens, Conifer, Colo., assignor to Gates Energy Products, Inc., Denver, Colo.

Filed Jul. 22, 1982, Ser. No. 400,775
Int. Cl.³ H01M *10/34*
U.S. Cl. 429—59 **4 Claims**



1. A sealed lead-acid gas recombining battery comprising a monobloc container having at least two substantially cylindrical cell compartments in close tangential proximity separated by an intercell partition, cell packs contained in a substantially snug fit within the compartments and comprising at least one positive plate and at least one negative separated from each other by a separator of compressible highly acid-absorbent material compressed against the plates, and an acid electrolyte substantially fully absorbed within the plates and separators of the cell, and the partition being provided with an aperture and a through-the-partition intercell connection comprised respectively of a plurality of malleable current collector tabs integral with the positive plate(s) of a cell pack of one compartment and a plurality of current collector tabs integral with the negative plates(s) of a cell pack of the adjoining cell compartment fused together at said aperture, said current collector tabs being formed of lead having a Brinell hardness (10 mm/31.2 kg–120 sec.) of less than about 10 kg/mm^2 and at least one of said tabs on each side of the partition being bent toward the aperture along a substantially smooth curve forming a bend angle with its corresponding plate of less that about 60°, and separator material being interposed between adjacent current collector tabs.

4,521,499

HIGHLY CONDUCTIVE PHOTOELECTROCHEMICAL ELECTRODES AND USES THEREOF

Jay A. Switzer, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed May 19, 1983, Ser. No. 496,284
Int. Cl.³ H01M *6/36*; C25B *1/02, 3/00*
U.S. Cl. 429—111 63 Claims

51. A photoelectrochemical cell employing a photoelectrode comprising a conductive coating material selected from the group consisting of Tl_2O_3, CdO, PbO_2, Cr_2O_3, RuS_2, $PtCoO_2$, $PdCoO_2$, $PdRhO_2$, and $PdCrO_2$, on a substrate containing a semiconductor material.

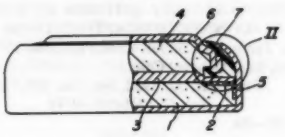
52. The cell defined in claim 51 comprising a photovoltaic cell.

4,521,500

LEAK-PROOF ALKALINE CELL

Osamu Watanabe, Toyonaka, Japan, assignor to Hitachi Maxell Limited, Osaka, Japan

Filed Dec. 1, 1982, Ser. No. 446,038
Claims priority, application Japan, Dec. 4, 1981, 56-195990; Dec. 4, 1981, 56-195992
Int. Cl.³ H01M *2/08*
U.S. Cl. 429—174 5 Claims



1. A leak-proof alkaline cell comprising positive and negative electrode materials, a member for accommodating said positive electrode materials, a member for covering said negative electrode materials and a gasket made of a polyamide provided between the members, characterized in that a sealant comprising asphalt and a ethylene-vinyl acetate copolymer in an amount of 0.5 to 25% by weight of said asphalt is interposed between said gasket and at least one of said members.

4,521,501

METHOD FOR REDUCING DEGRADATION OF AN OPTICAL IMAGE IN AN EXPOSURE LIGHTHOUSE

Frank T. D'Augustine, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 14, 1983, Ser. No. 513,399
Int. Cl.³ G03C *5/04*
U.S. Cl. 430—24 11 Claims

1. In a method for exposing a layer of photosensitive material on a support to an image of light produced with light emitted from a light source below said layer and passed upwardly through an optical element, the additional steps for reducing the degradation of said image of light resulting from extraneous matter normally deposited on said optical element from the ambient atmosphere, said steps comprising

(a) positioning a sheet of optically-transparent, optically-neutral material above said optical element,

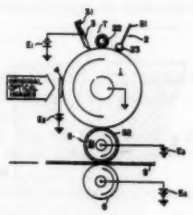
(b) and moving said positioned sheet with respect to said optical element during said exposing step in a direction having a substantial component transverse to said upwardly-passing light.

4,521,502

COLOR RECORDING METHOD

Katsuo Sakai, and Hiromi Demizu, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 16, 1982, Ser. No. 450,375
Claims priority, application Japan, Dec. 28, 1981, 56-211026
Int. Cl.³ G03G *13/01*
U.S. Cl. 430—42 6 Claims



1. A color recording method for recording images in color, comprising the steps of:

forming a uniform mixture of three types of translucent photoconductive toner particles in three primary colors in a hopper which holds said toner particles therein;

supplying said mixed toner particles from said hopper onto a doner member which is an electrically conductive doner roller;

forming a layer having a predetermined thickness of said uniform mixture of three types of translucent photoconductive toner particles on said doner member by a doctor blade means while applying a predetermined voltage of a first polarity to said layer of said toner particles through said doctor blade means;

subjecting the layer of the mixture of said photoconductive toner particles to a color image exposure, thereby selectively decreasing the electric resistivities of said toner particles in patterns corresponding to the color image exposure;

applying a predetermined voltage of a second polarity opposite to the first polarity across the layer of said photoconductive toner particles in the direction of thickness thereof during a period in which said photoconductive toner particles which have been made electrically conductive by the color image exposure thereto still maintain their decreased resistivities, at which resistivities charge injection into said photoconductive toner particles with decreased electric resistivities is possible, thereby forming a charge distribution in the layer of said photoconductive toner particles corresponding to the color image exposure;

separating the layer of said photoconductive toner particles into a charge-injected portion and a non-charge-injected portion in accordance with charge distribution; and

transferring said non-charge-injected portion onto a recording medium.

4,521,503

HIGHLY PHOTOSENSITIVE AQUEOUS SOLVENT-DEVELOPABLE PRINTING ASSEMBLY

Alan J. Herbert, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 11, 1984, Ser. No. 609,286
Int. Cl.³ G03G *13/28*
U.S. Cl. 430—49 18 Claims

1. A photoimageable printing assembly comprising:

(a) an electroconductive support, and

(b) a dual layer photosensitive construction comprising

(1) a photoresist lower layer sensitive to radiation in the wavelength range of 250 to 450 nm, said photoresist being soluble or dispersible in an aqueous solvent only, in either the exposed or unexposed areas, and

(2) a photoconductive upper layer comprising zinc oxide in a water-soluble or water-dispersible binder, said layer being sensitive to radiation above 250 nm, and said layer being dispersible in an aqueous solvent.

4,521,504

COMPOSITE PHOTOSENSITIVE MATERIAL FOR USE IN ELECTROPHOTOGRAPHY

Seiitj Sakuma, Tokyo, and Shuichi Karasawa, Kokubunji, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 76,095, Sep. 17, 1979, abandoned. This application Jun. 17, 1981, Ser. No. 274,620

Claims priority, application Japan, Sep. 22, 1978, 53-117273; Dec. 28, 1978, 53-163059; Dec. 28, 1978, 53-163060; Dec. 28, 1978, 53-163062

Int. Cl.³ G03G *5/12*

U.S. Cl. 430—57 **1 Claim**

1. A dichromatic electrophotography process, which comprises: providing a composite photosensitive material comprising an electrically conductive substrate layer made of a metal selected from the group consisting of Au, Pt and Pd, a first photoconductive layer made of As_2Se_3 laminated on said electrically conductive substrate layer, said first photoconductive layer being capable of absorbing and being rendered photoconductive by visible radiation having a first wavelength range, said first photoconductive layer possessing the properties that it can be charged only in one polarity in relation to said substrate and permits light decay, a second photoconductive layer laminated on said first photoconductive layer, said second photoconductive layer being capable of transmitting visible radiation of said first wavelength range and being capable of absorbing and being rendered photoconductive by visible radiation of a second wavelength range which is different from said first wavelength range, the sensitivity ratio of said second photoconductive layer to said first photoconductive layer being in the range of from 1 to 20 when said second photoconductive layer is irradiated with white light so that the sensitivity of said second photoconductive layer is its sensitivity to white light and the sensitivity of said first photoconductive layer is its sensitivity to white light minus the second wavelength range, said first and second photoconductive layers being capable of holding electric charges of opposite polarities with respect to each other and each being capable of accepting and also retaining surface potentials sufficient to develop an electrostatic latent image with toner; applying a first electrostatic charge of a polarity opposite to said one polarity to the second layer in the dark to form a charge of the opposite polarity on said second layer and to cause a second charge of said one polarity to be injected from said electrically conductive substrate layer into said first layer; then applying a second electrostatic charge of said one polarity to the second layer wherein the second electrostatic charge is of lower magnitude than said first electrostatic charge; and then radiating a light image onto said second layer capable of rendering photoconductive a partial region of a single one of said first photoconductive layer and said second photoconductive layer while leaving another partial region of said single photoconductive layer nonconductive whereby to form an electrostatic latent image in which the nonconductive region has a different polarity than the conductive region of said single photoconductive layer; and then developing said electrostatic latent image with two differently colored toners of opposite polarities.

4,521,505

ELECTROSTATOGRAPHIC SUSPENSION DEVELOPER AND PROCESS FOR THE PRODUCTION THEREOF

Wolfgang Podszun, Cologne; Walter Simm, Leverkusen; John Goossens, Cologne, and Carlhans Süling, Odenthal, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 23, 1983, Ser. No. 525,625

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232062

Int. Cl.³ G03G *9/12*

U.S. Cl. 430—112 **16 Claims**

1. An elecrostatographic suspension developer which suspends, as a toner, polymer-sheathed pigment particles in an electrically insulating carrier liquid having a volume resistance of at least 10^9 Ohm·cm and a dielectric constant of less than 3, and which optionally contains a dissolved control substance, characterised in that the toner has a particle size of from 0.2 to 2 μm and has a sheath consisting of cross-linked precipitation polymer which is formed from:

(A) at least 25 parts, by weight, of a (meth)acrylate having from 8 to 24 carbon atoms in the alcohol moiety,

(B) from 2 to 50 parts, by weight, of a cross-linker,

(C) from 2 to 50 parts, by weight, of a (meth)acrylate having from 1 to 7 carbon atoms in the alcohol moiety; and

(D) from 0 to 25 parts, by weight, of vinyl or vinylidene monomer which may be copolymerised with (A) and (C) and is different from (A) and (C),

the total of the weight quantities being 100 in each case, and in that from 25 to 90%, by weight, of the toner consists of the cross-linked precipitation polymer.

4,521,506

MONOAZO PYRIDINOL DYES CHELATED OR CAPABLE OF BEING CHELATED WITH METAL IONS AND THEIR USE FOR IMAGE PRODUCTION

Rudolf Stolzenburg, Langenfold; Peter Bergthaller, Cologne; Gerhard Wolfrum, Leverkusen, and Jürgen Strauss, Cologne, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 5, 1984, Ser. No. 617,499

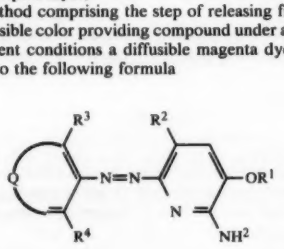
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1983, 3322058

Int. Cl.³ G03C *1/40, 5/51*

U.S. Cl. 430—241 **3 Claims**

3. The method of producing a light-stable magenta image by dye diffusion processing of an imagewise exposed color photographic recording material containing, associated with at least one light-sensitive silver halide emulsion layer, a non-diffusible color providing compound while in contact with a supported image receptor layer,

the method comprising the step of releasing from said non-diffusible color providing compound under alkaline development conditions a diffusible magenta dye corresponding to the following formula



I

wherein

Q represents the group required for completing a phenyl or naphthyl group,

R^1 represents H,

R^2 represents H, halogen or an alkyl- or aryl-sulphonyl group, and

R^3 and R^4 (identical or different) represent H or a substituent incapable of chelate formation,

and transferring at least part of said released azo dye to said image receptor layer and forming complexes with metal ions.

4,521,507

MULTI-LAYER LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Toshifumi Iijima, and Kiyoshi Yamashita, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 453,475
Claims priority, application Japan, Dec. 29, 1981, 56-212995
The portion of the term of this patent subsequent to May 1, 2004, has been disclaimed.
Int. Cl.³ G03C *1/46, 1/08*
U.S. Cl. 430—503 20 Claims

1. A multi-layer light-sensitive silver halide color photographic material having a plurality of light-sensitive silver halide emulsion layers on a support and having color couplers in said material, each of said silver halide emulsion layers having sensitivity to light at different spectral regions, wherein at least 80% of the total number of silver halide grains contained in at least one of said silver halide emulsion layers comprise 5–30% of silver halide grains having grain sizes greater than 0.8μ and 95–70% of silver halide grains smaller than 0.65μ.

4,521,508

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Tadao Sugimoto; Hideo Ikeda; Hiroyuki Mifune, and Koki Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 7, 1983, Ser. No. 549,515
Claims priority, application Japan, Nov. 8, 1982, 57-196494
Int. Cl.³ G03C *1/28*
U.S. Cl. 430—567 15 Claims

1. A silver halide photographic light-sensitive material, comprising:

a support base having thereon:

a silver halide emulsion layer; and

a protective layer;

wherein the light-sensitive material contains a photosensitive halide emulsion, an inside fogged silver halide emulsion, and a disulfide compound represented by the general formula (I):

$$A—S—S—B \quad (I)$$

wherein A and B independently represent an alkyl group, an aralkyl group, an aryl group, a heterocyclic group or

wherein R represents a alkyl group, an aryl group, an aralkyl group, a heterocyclic group or an amino group;

wherein at least one of A or B represents a heterocyclic group or

and

wherein the disulfide compound represented by general formula (I) is present is an amount effective to improve maximum density and gamma of an image.

4,521,509

METHOD FOR DEGRADING DNA

Stephen J. Benkovic, State College, Pa.; Scott D. Putney, Brigaton, and Paul R. Schimmel, Lexington, both of Mass., assignors to Research Corporation, New York, N.Y.

Filed Nov. 24, 1982, Ser. No. 444,304
Int. Cl.³ C12Q *1/68;* C12P *19/34;* C12N *15/00, 1/00;* G01N *31/14;* C07H *21/02, 21/04*
U.S. Cl. 435—6 28 Claims

1. A method for the asymmetric degradation of DNA comprising

(a) generating DNA fragments by the application of restriction endonucleases

(b) end-blocking one terminus of each of said fragments by the introduction of a thionucleotide analog protecting group said protecting group being capable of inhibiting exonuclease activity

(c) specifically degrading the non-protected terminus of said end-blocked fragment by the application of exonucleases.

24. In a method for the sequencing of DNA wherein chain growth is terminated the improvement comprising generating single stranded DNA of fixed length by:

(a) generating DNA fragments by the application of restriction endonucleases Dde I and Pvu I,

(b) end blocking the Dde I generated terminus by introduction of 2' deoxyadenosine 5'-O-(1-thiotriphosphate) by treatment with DNA polymerase I,

(c) degrading the strands containing the unprotected 3' termini with Exonuclease III for a sufficient period of time to effect the complete degradation of said strand,

(d) recovering the remaining single strand of DNA.

4,521,510

HYBRIDOMA CELL LINES AND MONOCLONAL ANTIBODIES TO THEOPHYLLINE

John E. Geltosky, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 406,554, Aug. 9, 1982,. This application Jan. 3, 1984, Ser. No. 567,890
Int. Cl.³ C12P *21/00;* C12N *5/00;* G01N *33/54;* A23J *1/00*
U.S. Cl. 435—7 11 Claims

1. A composition comprising a hybrid continuous cell line producing IgG isotype antibody to theophylline having 5% or less cross-reactivity with caffeine wherein the cell line is a hybrid of a spleen cell from a mouse immunized with an 8-substituted theophylline-carrier conjugate and a mouse myeloma cell.

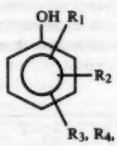
4,521,511

CATALYZED COLORIMETRIC AND FLUOROMETRIC SUBSTRATES FOR PEROXIDASE ENZYME DETERMINATIONS

Robert L. Stout, Overland Park, Kans., assignor to Enzyme Technology Company, Overland Park, Kans.

Filed Sep. 22, 1982, Ser. No. 421,263
Int. Cl.³ C12Q *1/28;* G01N *33/52, 33/54*
U.S. Cl. 435—28 5 Claims

1. In a system for developing a characteristic color in the presence of a peroxidase enzyme, said system including a peroxide oxidizing agent and 2,2'-azino-di(3-ethyl-benzthiazolone-6-sulfonic acid), the improvement which comprises a rate accelerator added to the system at a level of from about 1 microgram to about 1 milligram and said rate accelerator being selected from the group consisting of vanillin and compounds of the formula



wherein R_1 is a halogen, a halogen-substituted phenoxy compound, a hydroxyphenone or a carboxylic acid or alkyl ester thereof; R_2 is hydrogen, hydroxy, a halogen, substituted and unsubstituted alkyl groups having from 1–6 carbon atoms, inclusive, an amino group, or a carboxylic acid or alkyl ester thereof; and R_3, R_4 and R_5 are respectively a halogen or hydrogen.

4,521,512

MICROORGANISM IDENTIFICATION TECHNIQUE

Robert E. Silman, London, England, assignor to AMB Systems Corp., San Diego, Calif.

Continuation-in-part of Ser. No. 341,810, Jan. 22, 1982,. This application Sep. 28, 1982, Ser. No. 426,196

Claims priority, application United Kingdom, Oct. 1, 1981, 8129683

Int. Cl.³ C12Q *1/16, 1/04*

U.S. Cl. 435—35 **13 Claims**

1. A method for identifying microorganisms that are obligate parasites present in host cells comprising the steps of:

A adding to a specimen of said microorganisms that are obligate parasites present in host cells and host cells a radioactively emissive agent that is incorporated and metabolized therein to produce a mix of radioactively emissive protein products in a manner that depends on the metabolic mechanism of the microorganisms and host cells;

B separating said emissive emissive protein products;

C detecting the separated emissive protein products to derive a characteristic pattern functioning as an identifier for the microorganisms; and

D comparing said identifier of the microorganisms with a collection of identifiers representing known microorganisms to determine the identity of the microorganisms in the specimen.

4,521,513

PROTECTION AGAINST DENTAL CARIES

Roy R. B. Russell, Bromley, Northern Ireland, assignor to The Secretary of State of Social Services in Her Britannic Majesty's Government of the United Kingdon of Great Brtian and Northern Ireland, London, England

PCT No. PCT/6B82/00168, § 371 Date Feb. 3, 1983, § 102(e) Date Feb. 3, 1983, PCT Pub. No. WO82/04396, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 4, 1982, Ser. No. 466,336

Claims priority, application United Kingdom, Jun. 19, 1981, 8118886

Int. Cl.³ C12P *21/00;* **A61K** *39/40, 39/09;* **X12R** *1/46*

U.S. Cl. 435—68 **3 Claims**

1. A process for producing an antigen preparation, for use in the reduction or prevention of dental caries, from bacteria of the group *Streptococcus mutans* genetic group I, the preparation being substantially free from any heart cross reactive antigens derivable from *Streptococcus mutans,* wherein the process comprises growing bacteria of the group *Streptococcus mutans* genetic group I in a culture medium to produce a cell culture, removing at least the cell walls from the cell culture to leave a protein solution and separating the antigen preparation from the protein solution by a method of separation which comprises contacting the protein solution with immobilized antibody, washing unwanted materials from the immobilized antibody under such conditions that the antigen preparation is retained on the immobilized antibody and eluting the antigen preparation from the immobilized antibody under such conditions that the antibody remains in an immobilized state and the antigen preparation retains its antigenicity, wherein the immobilized antibody has a specificity for one or more antigenic proteins which have the following properties: they

(a) are present on the cell walls of strains of *Streptococcus mutans* genetic group I;

(b) are destroyed or extracted by treatment of said cell walls with boiling aqueous sodium dodecyl sulphate (SDS) solution (10 gm per liter) for 10 minutes but remain associated with said cell walls after treatment of the walls with aqueous SDS solution (10 gm per liter) at 15° C.;

(c) have a molecular weight of 70,000±5,000 by SDS-polyacrylamide gel electrophoresis (SDS-PAGE);

(d) are destroyed by proteolytic enzyme;

(e) have an isoelectric point of 4.45±0.24; and

(f) do not cross react with heart tissue.

4,521,514

PROCESS FOR PRODUCING AN ADDITION COMPOUND OF A DIPEPTIDE ESTER AND AN AMINO ACID ESTER

Kiyotaka Oyama, Hikari; Shigeaki Irino, Tokuyama; Tsuneo Harada, Shinnanyo, and Masao Nakamura, Yokohama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo; Ajinomoto Co., Inc. and Sagami Chemical Research Center, both of Tokyo, all of, Japan

Filed Jul. 22, 1983, Ser. No. 516,344

Claims priority, application Japan, Jul. 23, 1982, 57-128420

Int. Cl.³ C12P *21/02;* **C07C** *103/52*

U.S. Cl. 435—70 **12 Claims**

1. A process for producing an addition compound of a dipeptide ester and an amino acid ester comprising reacting aspartic acid and benzyloxycarbonyl chloride in an aqueous solution in the presence of a base to prepare a solution containing N-benzyloxycarbonyl aspartic acid, reacting separatedly phenylalanine with methanol in the presence of an acid to produce phenylalanine methyl ester, substituting excess methanol with water to convert it to an aqueous solution of phenylalanine methyl ester, admixing it with the above-prepared aqueous solution containing N-benzyloxycarbonyl aspartic acid, adding a proteolytic enzyme into the resulting mixture liquor under conditions, under which no substantial deactivation of the enzyme occurrs, reacting N-benzyloxycarbonyl aspartic acid with phenylalanine methyl ester to deposit an addition compound of N-benzyloxycarbonyl-α-L-aspartyl-L-phenylalanine methyl ester and phenylalanine methyl ester and recovering the addition compound.

4,521,515

BACTERIAL STRAIN FOR PURIFYING HYDROCARBONS POLLUTION AND PURIFICATION PROCESS

Kosei Hata, Osaka, Japan, assignor to Seiken Kai Foundation Juridical Person, Japan

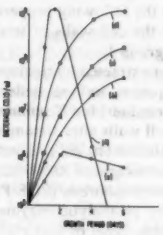
Filed Oct. 21, 1981, Ser. No. 313,405

Int. Cl.³ C12N *1/26, 1/20, 1/36, 15/00;* **C10G** *32/00;* **C12R** *1/38*

U.S. Cl. 435—248 **16 Claims**

1. A biologically pure culture of a Pseudomonas bacterium having all the identifying characteristics of Ferm BP-63, BP-64 or a mixture of BP-63 and BP-64 which exhibits an accelerated growth when hydrocarbons are added during a logarithmic growth phase of a growth curve which is generated during cultivation of the bacterium in a Stephanson Wetham trophic culture medium, and which emulsifies a hydrocarbon and brine

solution so that the solution becomes nearly transparent through a cloudy state by emulsification and wherein the



bacteria perishes after conclusion of assimilation of said hydrocarbons within about the period required for multiplication.

4,521,516

STRAIN OF *CLOSTRIDIUM ACETOBUTYLICUM* AND PROCESS FOR ITS PREPARATION

Christopher J. Lemme, Worth, and Jeffrey R. Frankiewicz, Lombard, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Nov. 18, 1982, Ser. No. 442,805

Int. Cl.[3] **C12N** *1/20, 15/00, 1/36;* **C12P** *7/26, 7/28, 7/36, 7/34, 7/16;* **C12R** *1/145*

U.S. Cl. 435—253 **6 Claims**

1. A process for preparing an asporogenic strain of *C. acetobutylicum* which comprises growing a seed culture from a spore-forming strain of *C. acetobutylicum*, inoculating a growth medium with the seed culture, and cultivating the inoculated growth medium under continuous conditions at a dilution rate sufficient to prevent accumulation of acetone and butanol in the medium for a sufficient time to form an asporogenic strain, and isolating the asporogenic strain.

6. A biologically pure culture of *C. acetobutylicum*, ATCC 3923.

4,521,517

COMPOST AERATION SYSTEM

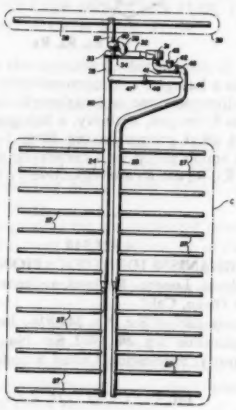
L. Paul Gauthier, Falls Church, Va., assignor to Gauthier, Alvarado & Associates, Inc., Falls Church, Va., a part interest

Filed Apr. 25, 1983, Ser. No. 488,435

Int. Cl.[3] **C12M** *1/00, 1/04;* **C05F** *11/08*

U.S. Cl. 435—313 **2 Claims**

1. A compost aeration system comprising a pair of elongated parallel main header pipes having spaced bottom moisture drain openings along their lengths, a plurality of branch lateral aeration pipes connected with the outer side of each main header pipe in spaced relationship along the length of the main header pipe, each branch lateral aeration pipe having plural opposite side air distribution apertures spaced along the length of the branch lateral aeration pipe and also having bottom spaced moisture drain apertures along the length of the branch lateral aeration pipe, said air distribution apertures of each branch lateral aeration pipe being graduated in size along the length of each branch lateral aeration pipe with the smaller apertures toward the inner end of each branch lateral aeration pipe and the larger apertures toward its outer end, a one-way non-reversible air blower disposed near corresponding ends of main header pipes, an air delivery pipe for the blower connected between an inlet of the blower and one end of one main header pipe, an air discharge pipe for the blower connected between an outlet of the blower and one end of the other main header pipe, a transfer pipe connected between the main header pipes, an ambient air inlet connected in said air delivery pipe for the blower between the blower and said one main header pipe, an adjustable damper in said air delivery pipe between said ambient air inlet and one end of said transfer pipe, an adjustable damper in said ambient air inlet, an adjustable damper in said air discharge pipe, and another adjustable damper in said transfer pipe, whereby air from the blower containing varying amounts of ambient air can be circulated continuously in opposite directions through the main header pipes and through the compost pile or may be forced in the



same direction through both main header pipes and blown outwardly through a compost pile to atmosphere or may be drawn by the blower in an opposite direction through both main header pipes and inwardly through a compost pile from the ambient atmosphere.

4,521,518

MULTI-PURPOSE BLOOD DILUENT AND LYSING AGENT FOR DIFFERENTIAL DETERMINATION OF LYMPHOID-MYELOID POPULATION OF LEUKOCYTES

James H. Carter, Ft. Lauderdale; Stephen L. Ledis, Hialeah, and Harold R. Crews, Miami, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of Ser. No. 159,782, Jun. 16, 1980, Pat. No. 4,346,018. This application Jul. 6, 1982, Ser. No. 395,530

The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.[3] **G01N** *33/48;* **C09K** *3/00*

U.S. Cl. 436—10 **12 Claims**

1. A multi-purpose isotonic blood diluent comprising a cell stabilizing mixture of:
   1. N-(2-acetamido)iminodiacetic acid,
   2. Procaine hydrochloride,
   3. at least one cell membrane stabilizer selected from the group consisting of:
      dimethylolurea,
      hexamethylenetetramine, and
      N-hydroxymethylacetamide,
   4. at least one germicide selected from the group consisting of:
      chlorhexidene diacetate,
      dimethylolurea, and
      sodium 1-hydroxypyridine-2-thione, and
   5. sodium sulfate and sodium chloride, in an osmotically balanced and substantially neutral solution.

2. A method which comprises the steps of:

I. treating a blood sample with an isotonic diluent comprising a cell stabilizing mixture of:
   1. N-(2-acetamido)iminodiacetic acid,
   2. Procaine hydrochloride,
   3. at least one cell membrane stabilizer selected from the group consisting of:

dimethylolurea,
hexamethylenetetramine, and
N-hydroxymethylacetamide,

4. at least one germicide selected from the group consisting of:
chlorhexidene diacetate,
dimethylolurea, and
sodium 1-hydroxypyridine-2-thione, and

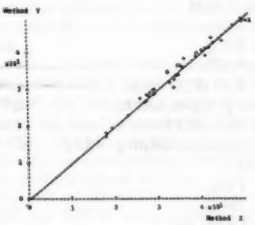
5. sodium sulfate and sodium chloride, in an osmotically balanced and substantially neutral solution, and then

II. lysing with a reagent comprising a mixture of an aqueous solution of at least one quaternary ammonium salt detergent and an alkali metal cyanide, said quaternary ammonium salt and said alkali metal cyanide being present in a concentration range which is effective to give a differential determination of lymphoid and myeloid populations of leukocytes followed by determination of hemogram values, particularly in automatic particle counting systems.

4,521,519
REAGENT FOR THE PRECIPITATION OF APO-B-CONTAINING LIPOPROTEINS

Brigitte Draeger, Tutzing, and Joachim Ziegenhorn, Starnberg, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,382
Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117455
Int. Cl.³ G02N *33/48*
U.S. Cl. 436—17 **27 Claims**



1. Reagent for the precipitation of apo-B-containing lipoproteins, comprising 0.2 to 3 grams of phosphotungstic acid per liter and at least 2 mmols of magnesium ions per liter in aqueous solution.

4,521,520
METHOD FOR IN HOUSE OCCULT BLOOD TESTING

Stanley E. Jacke, Malvern, Pa., assignor to SmithKline Diagnostics, Inc., Sunnyvale, Calif.

Filed Apr. 7, 1983, Ser. No. 483,083
Int. Cl.³ A61B *5/00*; G01N *33/50*
U.S. Cl. 436—66 **7 Claims**

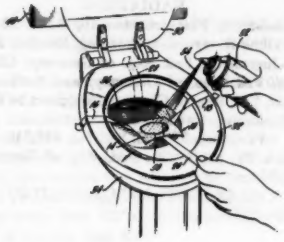
1. A method for determining the presence of occult blood in fecal matter which comprises:

suspending, via a multi-support suspension device, an absorbent test sheet from a seat of a toilet for the reception of fecal matter, said multi-support suspension device being configured to permit on-site rotation of said test sheet upon removal of one of said supports and

said sheet carrying a test reagent;

defecating onto said test sheet;

removing one of said supports and flipping said sheet over and exposing the underside of said sheet;



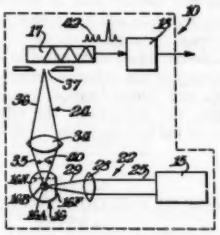
applying a developing solution to a portion of the underside of said sheet; and

observing whether a portion of said sheet is dyed blue.

4,521,521
PARTICLE REAGENT SIZE DISTRIBUTION MEASUREMENTS FOR IMMUNOASSAY

Scot D. Abbott, Wilmington, Del., and Michael A. G. Luddy, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 11, 1983, Ser. No. 474,483
Int. Cl.³ G01N *33/54*
U.S. Cl. 436—517 **11 Claims**



1. A method for determining the amount of an analyte in liquid medium comprising the steps of:

A. contacting said liquid medium with reagents including:
(1) analyte specific antibody, and
(2) insoluble particles coated with analyte to form an aggregating reaction mixture comprisng said particles and different sized aggregates thereof;

B. flowing said reaction mixture through an optically defined viewing zone upon which focused laser radiation is incident such that individual insoluble particles or individual aggregates thereof flowing through said zone produce discrete pulses of scattered radiation, each of said pulses having a magnitude which is a function of the size of the particle or individual aggregate from which the radiation was scattered;

C. collecting said discrete pulses of radiation scattered from said viewing zone in a volume defined by a cone having an apex at said viewing zone and having a central axis substantially perpendicular to the incident focused laser radiation; and

D. analyzing said discrete pulses of scattered laser radiation to determine the size distribution of said insoluble particles and individual aggregates thereof in said reaction mixture as a function of time subsequent to contacting said liquid medium with said reagents thereby determining the amount of said analyte initially present in said liquid medium.

4,521,522
OPTICAL SPECIFIC BINDING ASSAY WITH REFLECTION OF POLARIZED ELECTROMAGNETIC RADIATION

Kurt I. Lundström, Faergaregatan 10, S-582 52 Linkoeping, Sweden; Hans R. Arwin, Linkoeping, Sweden; Erwin Ricke, Seeheim-Jugenheim, Fed. Rep. of Germany; Günter Sielaff, Bensheim, Fed. Rep. of Germany, and Norbert Hennrich, Darmstadt, Fed. Rep. of Germany, assignors to Kurt I. Lundstroem, Linkoping, Sweden

Filed Sep. 7, 1982, Ser. No. 415,510

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135196

Int. Cl.³ G01N *33/54, 33/78, 21/21*

U.S. Cl. 436—525 **11 Claims**

1. A method for the quantitative determination of a component of an organic system comprising a specifically bonding receptor component and a substance component which can be specifically bonded by the receptor, comprising

incubating one of the components, after it has been immobilized on the surface of a material having a refractive index effectively different from that of the organic system, with the other specific component;

irradiating said surface with an effective beam of electromagnetic radiation which is polarized parallel to the plane of incidence, the angle of incidence of the radiation being approximately equal to or equal to the angle Φ at which the intensity of the radiation reflected from said surface, prior to said immobilization, reaches a minimum; and measuring the intensity of the reflected radiation as a measure of the concentration to be determined.

4,521,523
METHODS OF INTRODUCING FLUORINE INTO GLASSES

Patrick F. Aubourg, Granville, and Barbara L. Fabricant, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 435,029, Oct. 18, 1982, abandoned. This application Dec. 30, 1983, Ser. No. 566,779

Int. Cl.³ C03C *1/00, 3/04*

U.S. Cl. 501—30 **7 Claims**

1. A method of introducing fluorine into glasses characterized by high fluorine retention in said glasses and by low processing costs, comprising:

a. preparing a pulverized, fluorine-containing frit;

b. preparing a glass batch comprising said pulverized frit, which said pulverized frit provides substantially all of said fluorine in said glass batch; and

c. melting said glass batch to form a fluorine-containing glass.

7. A method of introducing fluorine into glasses characterized by high fluorine retention in said glasses and by low processing costs, comprising:

a. preparing a pulverized, fluorine-containing frit comprising about 52 to about 57 weight percent silicon dioxide, about 14 to about 15 weight percent Al_2O_3, about 22 to about 24 weight percent calcium oxide, and about 6 to about 10 weight percent fluorine;

b. preparing a glass batch comprising about 4 to about 29 weight percent of said pulverized frit, which said pulverized frit provides substantially all of said fluorine in said glass batch; and

c. melting said glass batch to form a fluorine-containing glass in which said glass said fluorine retention is about 76 to about 100 weight percent of said fluorine in said glass batch.

4,521,524
CONTRAST ENHANCEMENT FILTER FOR COLOR CRT DISPLAY DEVICES

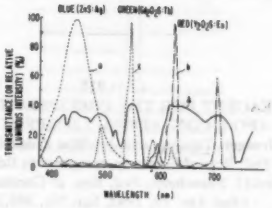
Toshiharu Yamashita, Tokyo, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,664

Claims priority, application Japan, Sep. 21, 1981, 56-147797

Int. Cl.³ C03C *3/04, 3/10;* **H01J** *29/86*

U.S. Cl. 501—64 **7 Claims**



1. A glass filter for contrast enhancement in color CRT display devices consisting essentially of

100 parts by weight of a base glass consisting essentially of, in % by weight

3 to 70% SiO_2,

0 to 40% B_2O_3,

0 to 23% Al_2O_3

0 to 23% R_2O (R_2O being at least one component selected from the group consisting of Li_2O, Na_2O and K_2O),

2 to 35% RO (RO being at least one component selected from the group consisting of MgO, CaO, SrO, BaO, ZnO and PbO),

0 to 10% TiO_2,

0 to 10% ZrO_2,

0 to 35% La_2O_3 and

5 to 40% Nd_2O_3,

0.01 to 1.0 parts by weight of CuO, and

at least one coloring component selected from the group consisting of 6 parts by weight or less CeO_2, 3.5 parts by weight or less MnO_2, 0.15 parts by weight or less CoO, 3.0 parts by weight or less Fe_2O_3, 1.5 parts by weight or less NiO and 5.0 parts by weight or less Pr_6O_{11}.

4,521,525
SILICON NITRIDE BODIES

Martin Y. Hsieh, Palo Alto, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 29, 1984, Ser. No. 614,895

Int. Cl.³ C04B *35/52*

U.S. Cl. 501—98 **3 Claims**

1. A composite consisting essentially of, in percent by weight: from about 20% to about 40% of a hard material selected from the group consisting of titanium carbide, titanium nitride, and mixtures thereof, from about 3% to about 7% lanthanum aluminate, and the balance silicon nitride.

4,521,526
METHODS FOR REPROCESSING COBALT CATALYSTS USED IN HYDROCARBOXYLATION

Peter Hofmann, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 203,393, Nov. 3, 1980, abandoned. This application Jul. 25, 1983, Ser. No. 516,435

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2949939; Dec. 12, 1979, 2949878

Int. Cl.[3] **B01J** *31/40;* **C07C** *67/38;* **C11C** *3/02;* **C09F** *5/08*

U.S. Cl. 502—24 **13 Claims**

1. A method for reprocessing a cobalt catalyst from cobalt salts of carboxylic acids, said catalyst mixed with the reaction product of olefins, carbon monoxide, and an alkanol, comprising:

(a) treating said catalyst and reaction product with counterflow air at a temperature of about 20°–150° C. to produce an oxidized catalyst;

(b) separating said oxidized catalyst from said reaction product by distillation;

(c) hydrogenating said separated oxidized catalyst at about 20°–300° C. and an H_2 hot pressure of about 50–500 bars with an added solvent to form a hydrogenated cobalt catalyst and filtering said hydrogenated cobalt catalyst under an inert gas to obtain said hydrogenated cobalt catalyst in pyrophoric form;

(d) treating said hydrogenated cobalt catalyst with an aqueous dispersion of a carboxylic acid having 1 to 4 carbon atoms at a temperature of 20°–100° C. to form a cobalt salt of said carboxylic acid;

(e) separating said cobalt salt; and

(f) recirculating said cobalt salt as said cobalt catalyst with a recovery of 98.4–99% of said cobalt catalyst.

5. A method for reprocessing cobalt catalyst from cobalt salts of carboxylic acids used in the reaction of olefins with carbon monoxide and an alkanol, comprising:

(a) reacting said olefins with said carbon monoxide and said alkanol in the presence of said cobalt catalyst to form a reaction output;

(b) oxidizing said reaction output with countercurrent oxygenated gas at a temperature from about 20°–150° C. to form a pretreated reaction output containing oxidized catalyst; (c) carrying out a stepwise distillation of said pretreated reaction output, separating an ester fraction and leaving a distillation sump product containing a cobalt residue including said oxidized catalyst;

(d) hydrogenating said cobalt residue at a temperature between about 20° and 300° C. and a hydrogen pressure of about 50–500 bars with added solvent to form metallic cobalt;

(e) separating said metallic cobalt obtained by filtration under an inert gas to obtain said metallic cobalt in pyrophoric form;

(f) reacting said separated metallic cobalt with an acid to form a cobalt salt; and

(g) recirculating said carboxylic acid salt as said cobalt catalyst with a recovery of 98.4–99% of said cobalt catalyst.

6. The method of claim 5, further comprising transforming said cobalt salt into a second cobalt salt.

4,521,527
MOLDED IRON CATALYST AND ITS PREPARATION

Gerhard Frank, Hirschberg; Peter Rudolf, Neuhofen; Gerald Neubauer, Weinheim; Manfred Ohlinger, Frankenthal; Hans J. Wilfinger; Emil Pfannebecker, both of Schifferstadt, and Paul Duffner, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 18, 1983, Ser. No. 524,319

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231192

Int. Cl.[3] **B01J** *23/78, 23/74;* **C07C** *5/12, 87/14*

U.S. Cl. 502—184 **4 Claims**

1. A molded iron catalyst having an indentation hardness greater than 300 kp/cm^2 which consists essentially of metallic iron particles having a degree of reduction of ≧95% and obtained from anisometric γ-iron oxide particles by contact with hydrogen at ≦500° C., and 1 to 5% by weight of graphite as a lubricant.

2. The catalytic material of claim 1, wherein the iron oxide used contains less than 0.1% by weight, calculated as sodium oxide, of alkali.

4. A process for the preparation of a molded iron catalyst comprising the following steps:

(a) reducing anisometric γ-iron oxide particles with hydrogen at from 250° to 500° C. to metallic iron particles having a degree of reduction of ≧95%;

(b) stabilizing the metallic iron particles by treatment with a mixture of air and nitrogen while maintaining a temperature of not more than 100° C. and achieving a degree of reduction of not less than 80%;

(c) pelletizing the stabilized metallic iron particles together with 1 to 5% by weight of graphite to form moldings; and

(d) activating said moldings by treatment with hydrogen at ≦500° C. achieving a degree of reduction of ≧95%.

4,521,528
PREPARATION OF ZIRCONIUM PHOSPHATE ACTIVATED CARBON ADSORBENT

Julius L. Kovach, 2948 Brookdown Dr., Worthington, Ohio 43085

Filed Oct. 28, 1983, Ser. No. 546,371

Int. Cl.[3] **B01J** *27/14, 31/02, 27/20*

U.S. Cl. 502—208 **10 Claims**

1. A method for preparing a homogenous activated carbon/-zirconium phosphate or hafnium phosphate product in situ which comprises:

(a) mixing a carbonaceous organic material, a zirconium or hafnium compound, and phosphoric acid or a phosphate salt; and

(b) heat-treating said mixture under conditions to convert said carbonaceous material into activated carbon and to convert said zirconium or hafnium compound into zirconium phosphate or hafnium phosphate.

4,521,529
CATALYST FOR CRACKING KEROSENE

C. H. Hsie, Fong Shan, Taiwan, assignor to Son Su Kung, Fong Shan, Taiwan

Filed Sep. 4, 1984, Ser. No. 646,858

Int. Cl.[3] **B01J** *27/02, 29/00, 29/06, 23/62*

U.S. Cl. 502—217 **5 Claims**

1. A catalyst capable of cracking kerosene under low temperature and pressure comprising: (A) kerosene; (B) metal powder mixture of chromium powder, copper powder, lead powder, zinc powder, nickel powder, manganese powder in an amount of 12 to 13 parts by weight per 100 parts of weight of said kerosene; (C) sulfuric acid in an amount of 15 to 30 parts by weight per 100 parts by weight of said kerosene; (D) inorganic powder mixture of aluminum oxide powder, serpentine powder, alum powder, magnesium oxide powder, limestone powder, slake lime powder, silica powder, and granite powder in an amount of 150 to 170 parts by weight per 100 parts by weight of said kerosene.

4,521,530
CATALYST OF PALLADIUM, COPPER AND NICKEL ON A SUBSTRATE

Victor F. Zackay, New Canaan, Conn., and Donald R. Rowe, Bowling Green, Ky., assignors to Teledyne Industries, Inc., Teledyne Water Pik, Fort Collins, Colo.

Filed Jun. 15, 1983, Ser. No. 504,517

Int. Cl.[3] **B01J** *23/72, 23/89*

U.S. Cl. 502—218 **13 Claims**

1. An oxidation catalyst consisting essentially of palladium, nickel, and copper on a substrate.

4,521,531
CATALYST FOR ANTHRAQUINONE HYDROGEN PEROXIDE PROCESS

John S. Coates, Chesapeake City, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 15, 1983, Ser. No. 523,190
Int. Cl.³ B01J *29/06, 29/12*
U.S. Cl. 502—242 2 Claims

1. A process for preparing a palladium-on-silica catalyst, the process comprising

(a) preparing an aqueous slurry of 20–30% by weight of amorphous particulate silica, the particles having an average particle size of 90–110 microns, at least 95% by weight of the particles being larger than about 44 microns and substantially no particles being larger than about 250 microns;

(b) adding to the slurry of (a) enough of a solution of a water-soluble palladium salt in acid to give the particulate silica a palladium content of 0.1–2% by weight, and enough of a solution of an additive water-soluble salt of zirconium, thorium, hafnium, cerium, titanium or aluminum in acid to give the particulate silica an additive salt content (measured as the oxide) of 0.025–0.5% by weight;

(c) bringing the pH of the slurry of (b) to about 0.8–1.0;

(d) bringing the pH of the slurry of (c) to about 2.3–2.7 and the temperature to 65°–75° C.;

(e) bringing the pH of the slurry of (d) to about 3.8–4.2 and holding it there for 5–25 minutes;

(f) bringing the pH of the slurry of (e) to about 6.8–7.2 and holding it there for 5–15 minutes;

(g) reducing the palladium salt thus deposited on the silica to palladium metal;

and then

(h) freeing the slurry of (g) of residual salts and then separating the catalyst from the slurry.

4,521,532
MONOLITHIC CATALYTIC CONVERTER FOR IMPROVED THERMAL PERFORMANCE

Byong K. Cho, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1984, Ser. No. 602,747
Int. Cl.³ B01J *35/04*
U.S. Cl. 502—439 3 Claims

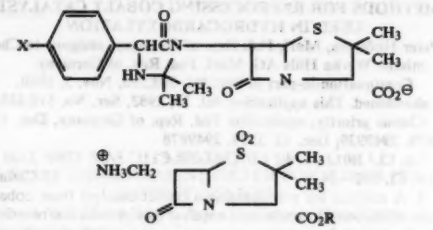
1. A monolithic honeycomb structure for treatment of automotive exhaust gas comprising a plurality of open-ended channels having interconnected walls extending longitudinally through the structure, said channels being formed to provide a periodic pattern of different cross-sectional gas flow areas such that each channel has a plurality of neighboring channels of different gas flow cross-sectional area to induce different flow velocities of the exhaust gas in adjacent channels, and to thereby produce temperature gradients between the adjacent channels to promote heat transfer in the transverse direction between them.

4,521,533
SALTS OF 6-ALPHA-(AMINOMETHYL)PENICILLANIC ACID 1,1-DIOXIDE ESTERS AND BETA-LACTAM ANTIBIOTICS

Ernest S. Hamanaka, Gales Ferry, and John G. Stam, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

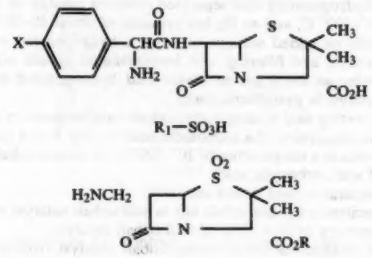
Filed Jul. 12, 1984, Ser. No. 630,147
Int. Cl.³ A61K *31/675, 31/43;* C07D *499/26*
U.S. Cl. 514—80 16 Claims

1. Salts of the formula



wherein X is selected from the group consisting of hydrogen and hydroxy, and R is an ester forming residue readily hydrolyzable in vivo.

7. Salts of the formula



wherein X is selected from the group consisting of hydrogen and hydroxy, R is an ester forming residue readily hydrolyzable in vivo; and R_1 is selected from the group consisting of hydroxy, and A—SO_3H, A—CO_2H and A—PO_3H_2 where A is selected from the group consisting of alkylene having two to four carbon atoms, phenylene and cycloalkylene having from five to six carbon atoms.

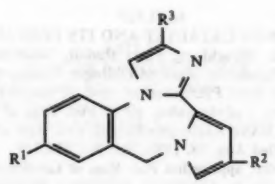
15. A pharmaceutical composition in dosage unit form for treating infectious bacterial diseases which comprises an antibacterially effective amount of a salt according to claim 1 or 7 and a pharmaceutically acceptable carrier therefor.

4,521,534
IMIDAZO[2,1-A]PYRROLO[2,1-c][1,4]BENZODIAZEPINE DERIVATIVES, METHODS OF PREPARATION AND USE

Jean A. Gauthier, Montreal; Katherine Voith, Dorval, and André A. Asselin, St. Laurent, all of Canada, assignors to Ayerst, McKenna & Harrison, Ltd., Montreal, Canada

Filed Dec. 19, 1983, Ser. No. 562,905
Int. Cl.³ A61K *31/55;* C07D *487/22*
U.S. Cl. 514—219 16 Claims

1. A compound of the formula



(I)

in which R^1 is hydrogen, halo or lower alkyl; R^2 is hydrogen or CS-R^4 wherein R^4 is 4-morpholinyl, 4-thiomorpholinyl, 1-pyrrolidinyl, 1-piperidinyl, 4-(lower alkyl)-1-piperazinyl or

4-(4-fluorophenyl)-1-piperazinyl; and R^3 is hydrogen or lower alkoxycarbonyl, or a therapeutically acceptable acid addition salt thereof.

14. A method of reducing food intake in a mammal, which comprises administering to the mammal an effective food intake reducing amount of a compound of claim 1, or a therapeutically acceptable acid addition salt thereof.

4,521,535

4-PYRIDONE-3-CARBOXYLIC ACID DERIVATIVES

Alexander E. Wick, Riehen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

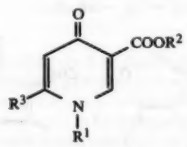
Continuation of Ser. No. 187,878, Sep. 17, 1980, abandoned, which is a continuation of Ser. No. 002,474, Jan. 10, 1979, abandoned. This application Apr. 19, 1982, Ser. No. 369,778

Claims priority, application Switzerland, Jan. 18, 1978, 51278/78; Nov. 15, 1978, 11734/78

Int. Cl.³ A61K *31/435;* **C07D** *213/80*

U.S. Cl. 514—222 **5 Claims**

1. A compound of the formula

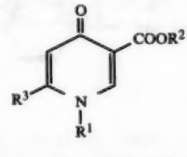


I

wherein R^1 is C_{1-8}-alkyl, C_{3-10}-cycloalkyl, C_{3-10}-cycloalkyl-C_{1-6}-alkyl, C_{1-6}-alkoxy or C_{1-6}-alkoxy-C_{1-6}-alkyl; R^2 is hydrogen or C_{1-6}-alkyl; R^3 is phenethyl or styryl, which is substituted by R^4, R^5 and/or R^6; R^4 and R^5, independently, are halogen, trifluoromethyl, hydroxy, C_{1-6}-alkoxy, C_{1-6}-alkylthio, C_{1-6}-alkyl, amino, acylamino, C_{1-6}-alkylamino, di-C_{1-6}-alkylamino, nitro or a 5-membered or 6-membered heterocycle linked via ring N- or C-atom or R^4 and R^5 taken together are C_{1-6}-alkylenedioxy; R^6 is C_{1-6}-alkoxy,

or a pharmaceutically acceptable salt thereof.

5. A pharmaceutical composition comprising a compound of the formula



I

wherein R^1 is C_{1-8}-alkyl, C_{3-10}-cycloalkyl, C_{3-10}-cycloalkyl-C_{1-6}-alkyl, C_{1-6}-alkoxy or C_{1-6}-alkoxy-C_{1-6}-alkyl; R^2 is hydrogen or C_{1-6}-alkyl; R^3 is phenethyl or styryl, which is substituted by R^4, R^5 and/or R^6; R^4 and R^5, independently, are halogen, trifluoromethyl, hydroxy, C_{1-6}-alkoxy, C_{1-6}-alkylthio, C_{1-6}-alkyl, amino, acylamino, C_{1-6}-alkylamino, di-C_{1-6}-alkylamino, nitro or a 5-membered or 6-membered heterocycle linked via ring N- or C-atom or R^4 and R^5 taken together are C_{1-6}-alkylenedioxy; R^6 is C_{1-6}-alkoxy,

or a pharmaceutically acceptable salt thereof and a carrier material.

4,521,536

PESTICIDAL NITROMETHYLENE DERIVATIVES

Martin Harris, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

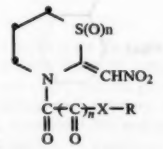
Filed Feb. 8, 1984, Ser. No. 578,144

Claims priority, application United Kingdom, Feb. 17, 1983, 8304386; Apr. 26, 1983, 8311358; Sep. 23, 1983, 8325539

Int. Cl.³ C07D *279/04;* **A01N** *43/86*

U.S. Cl. 514—226 **3 Claims**

1. A compound of the formula



wherein n is zero or one, m is zero or one, X is oxygen or sulfur and R is alkyl, alkenyl or alkynyl of up to six carbon atoms optionally substituted by one or more halogen, or by hydroxy; mercapto; formyloxy; thioformyl; or alkanoyloxy, alkanoylthio, alkoxy, alkylthio, alkoxyalkoxy, or haloalkoxy wherein the alkyl moiety contains from one to four carbon atoms; or phenyl optionally substituted by one or more of halogen and alkyl of from one to four carbon atoms.

3. An insecticidal composition, that comprises an effective amount of a compound of claim 1 together with an inert carrier, optionally a surface-active agent.

4,521,537

SPIRO[2H-1,4-BENZODIOXEPIN-3(5H)4'-PIPERIDINE AND -3'-PYRROLIDINE] COMPOUNDS AND THEIR USE AS ANTIHYPERTENSIVE AGENTS

Raymond W. Kosley, Jr., Bridgewater, and Robert J. Cherill, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

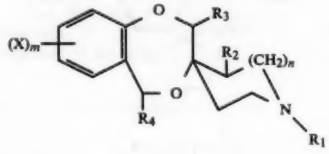
Continuation-in-part of Ser. No. 410,155, Aug. 20, 1982, Pat. No. 4,405,631. This application Apr. 2, 1984, Ser. No. 595,781

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.³ C07D *491/113;* **A61K** *31/455*

U.S. Cl. 514—302 **89 Claims**

1. A compound of the formula



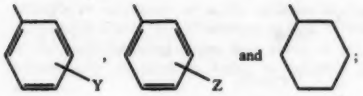
wherein

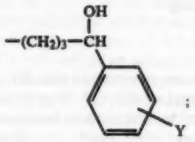
m is zero, 1 or 2;

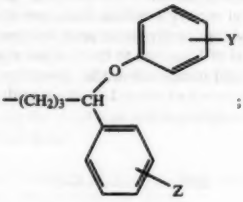
n is zero or 1;

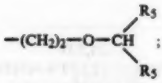
(a) a C_1 to C_5 branched or straight chain alkyl group;

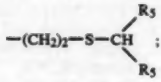
(b) a terminally substituted C_1 to C_5 branched or straight chain alkyl group, or a terminally substituted C_2 to C_5 branched or straight chain alkenyl group, or a terminally substituted C_4 alkynyl group, wherein the terminal substituents are one or two substituents independently selected from the group consisting of

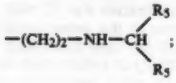


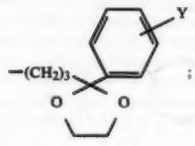
(c)


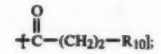
(d)


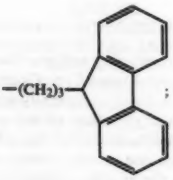


(f)


(g)


(h)


(i)


(j)


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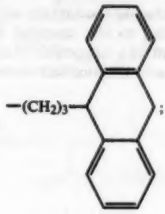
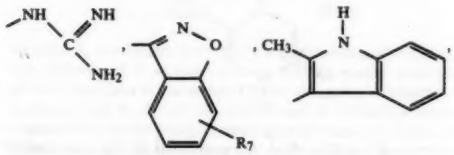
(k)


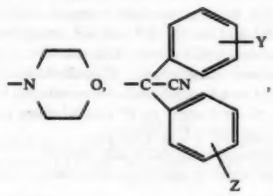
(l) a C_1 or C_2 alkylene group terminally substituted by

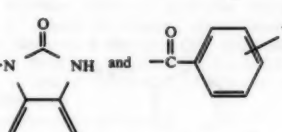
or C_3 to C_5 cycloalkyl;

(m) a C_2 to C_3 straight chain alkylene group terminally substituted by one substituent selected from the group consisting of

$-OH$, $-CN$, $-NR_{12}R_{13}$,

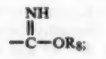
(e)


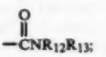


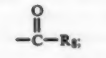


(i)

(n)
$-CN$;

(o)


(p)


(q)


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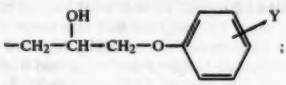
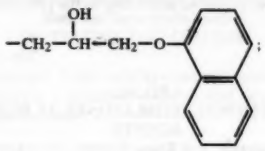
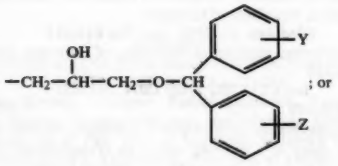
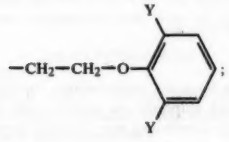
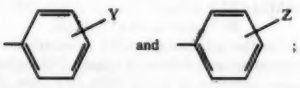

(r)


(s)

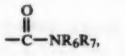

(t)


(u)

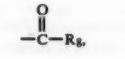
R_2 is hydrogen when n=0 or R_2 is hydrogen or a C_1 to C_3 straight chain alkyl group when n=1;
R_3 is hydrogen or a C_1 to C_3 straight chain alkyl group,
R_4 is hydrogen or a C_1 to C_3 straight chain alkyl group;
each R_5 substituent is independently selected from the group consisting of



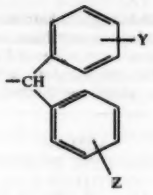
X is Cl, F, Br, I, $-NO_2$, $-CF_3$, $-NR_6R_7$,



C_1 to C_8 branched or straight chain alkyl, —CN, $-O-R_6$, $-SR_7$, $-SO_3R_7$,



$-NHCOR_8$, $-SO_2R_9$ or $-SOR_9$ where
R_6 is hydrogen or a C_1 to C_6 straight chain alkyl group;
R_7 is hydrogen or a C_1 to C_6 straight chain alkyl group;
R_8 is a C_1 to C_6 branched or straight chain alkyl group;
R_9 is a C_1 to C_6 straight chain alkyl group; provided that when m=2, the X-substituents can be the same only when X is selected from the group consisting of Cl, F, Br, I, C_1 to C_6 branched or straight chain alkyl or $-O-R_6$;
Y and Z are the same or different and are independently selected from the group consisting of H, Cl, F, Br, I, $-NO_2$, $-CF_3$, C_1 to C_4 straight chain alkyl, alkoxy containing C_1 to C_4 straight chain alkyl, acyl or $-NH_2$;
R_{10} is



R_{12} and R_{13} are the same or different and are independently selected from the group consisting of hydrogen, methyl and ethyl; and the pharmaceutically acceptable salts and optical and geometric isomers thereof.

85. A method for reducing hypertension in a mammal by administering to a mammal, in a amount sufficient to reduce blood pressure in the mammal, a compound as defined in claim **1**.

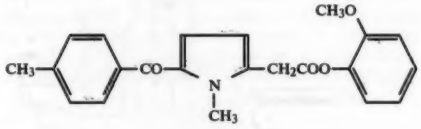
4,521,538

ESTER OF THE 1-METHYL-5-P-TOLUOYLPYRROLE-2-ACETIC ACID HAVING ANTIINFLAMMATORY, MUCOLYTIC AND ANTITUSSIVE PROPERTIES, PROCESS FOR ITS PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Alessandro Baglioni, Rome, Italy, assignor to Medosan Industrie Biochimiche Riunite S.p.A., Albano Laziale, Italy

Filed Mar. 4, 1983, Ser. No. 472,255
Claims priority, application Italy, Mar. 5, 1982, 47938 A/82
Int. Cl.³ C07D *207/323;* A61K *31/40*
U.S. Cl. 514—423 **3 Claims**

1. A compound, 1-methyl-5-p-toluoylpyrrole-2-acetic acid guaiacyl ester having the formula



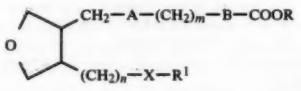
4,521,539

TETRAHYDROFURANYL SUBSTITUTED ETHERS

Jagabandhu Das, Plainsboro, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 10, 1984, Ser. No. 609,054
Int. Cl.³ A61K *31/34;* C07D *307/16*
U.S. Cl. 514—461 **19 Claims**

1. A compound of the structure



including all stereoisomers thereof, wherein A is $(CH_2)_2$, CH=CH or a single bond; B is a single bond or —CH=CH—; m is 1 to 8; n is 1 to 4; X is O or

wherein n' is 0, 1 or 2; R is H, lower alkyl or alkali metal; and

R^1 is lower alkyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl or lower alkenyl.

11. A method of inhibiting arachidonic acid-induced platelet aggregation and broncho-constriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,521,540
PROCESS FOR PRODUCING DIMETHYL ETHER FORM SYNTHESIS GAS

Ronald Pierantozzi, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

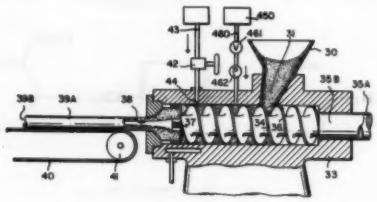
Filed Mar. 22, 1984, Ser. No. 592,324
Int. Cl.³ C07C *27/06*
U.S. Cl. 518—717 **5 Claims**

1. In a Fischer Tropsch Process for converting synthesis gas comprising carbon monoxide and hydrogen to oxygenated hydrocarbons, said conversion being effected by reacting carbon monoxide and hydrogen in the gas phase over a metal carbonyl cluster catalyst, for a time and at a temperature sufficient to form said oxygenated hydrocarbon, the improvement for selectively forming dimethyl ethyl which comprises utilizing an alkali metal salt of a manganese-iron carbonyl cluster supported on a zirconia-alumina support.

4,521,541
PROCESS FOR FORMING FUNCTIONAL FLUID AND SOLID-CONTAINING THERMOPLASTIC FILMS, USES THEREOF AND PROCESS FOR PRODUCING SAME

Howard J. Rutherford, Kinnelon, and Donald A. Withycombe, Lincroft, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Feb. 9, 1983, Ser. No. 465,313
Int. Cl.³ B29D *27/00*
U.S. Cl. 521—79 **9 Claims**



1. A process for preparing a perfume-containing foamed polymeric article of manufacture utilizing apparatus comprising a single screw or a twin screw extruder comprising an extruder barrel, said extruder barrel having a multiplicity of barrel segments, located within the extruder barrel, one or two parellel extruder screws, said extruder barrel having a first orifice at the location of a first extruder segment, a second orifice located at a second barrel segment at least one barrel segment downstream from said first barrel segment, and a third orifice located at a third barrel segment at least one barrel segment downstream from said second barrel segment, comprising the steps of:

(i) extruding a thermoplastic resin with a volatile perfume composition which is compatible with said thermoplastic resin, by adding said thermoplastic resin at said first orifice of said extruder and adding said perfume composition at said second orifice of said extruder, while simultaneously adding downstream from said second orifice, at said third orifice, a gaseous blowing agent selected from the group consisting of nitrogen and carbon dioxide; and

(ii) then pelletizing the product so extruded

the temperature range in the extruder being from about 160° up to about 240° C.; the feed rate of the resin being from about 80 up to about 300 lbs. per hour into the extruder; the pressure of the gaseous blowing agent at said third orifice being from about 80 up to about 150 psig; the feed rate range of perfume composition at said second orifice being between 1 and 35 percent of the feed rate range of said resin; said thermoplastic resin being compatible with said perfume composition.

6. The product prepared according to the process of claim 1.

4,521,542
ARYLSULPHONYL HYDRAZONES AS BLOWING AGENTS

Ernst Roos, Odenthal, and Klaus Kircher, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 11, 1984, Ser. No. 619,612
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1983, 3322320
Int. Cl.³ C08J *9/06*; C07C *143/825*
U.S. Cl. 521—89 **4 Claims**

1. A process for the production of a cellular polymer which comprises using as a blowing agent an arylsulphonyl hydrazone corresponding to the following general formula:

$$Ar(SO_2—NH—N=R)_x \quad (I)$$

wherein

Ar represents a benzene, naphthalene, diphenyl, diphenyl ether, diphenyl sulphone or diphenylene oxide radical which may be substituted one or more times by methyl and/or chlorine;

R represents the residue of an aldehyde or ketone without the carbonyl oxygen atom; and

x represents 1 or 2.

4,521,543
NON-FLAMMABLE RIGID FOAM AND ITS USE AS A BUILDING MATERIAL

Erich Rühl, Saalburgstrasse 65, 6382 Friedrichsdorf/Ts., Fed. Rep. of Germany, and Johann Thenner, Pohlheim, Fed. Rep. of Germany, assignors to Erich Rühl, Fed. Rep. of Germany

Division of Ser. No. 555,403, Nov. 28, 1983,. This application Jul. 31, 1984, Ser. No. 636,233
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1982, 3244779
Int. Cl.³ C08J *9/14*
U.S. Cl. 521—103 **4 Claims**

1. A non-flammable rigid foam on the basis of phenolic resin and for furane resin, containing aluminium hydroxide as a filler, the resin component being formed by reaction of phenolic resin, furfuryl alcohol and a sulpho acid as curing agent, wherein

the mass ratio of resin substance: filler substance is at least 1:2,5 and up to 1:3,2 and the bulk density is from 50 kg/m³ to 450 kg/m³ and the resin compound is the reaction product obtained by the reaction with one another of

50–62 mass parts resolic resin

0–15 mass parts furanic resin

25–40 mass parts furfuryl alcohol

0.5–1.5 mass parts foam stabiliser

including 14–17 parts by mass per 100 parts by mass of resin component + filler substance of a curing agent mixture composed of

'–50 mass parts phosphoric acid

12–17 mass parts boron hydrofluoric acid

6–7 mass parts p-toluene sulphonic acid or p-phenol sulphonic acid and

32–35 mass parts water.

4,521,544
POLYURETHANE FOAM FROM CELLULOSIC PRODUCTS
Richard B. Kennedy, Ridgefield, Conn., assignor to Patrick J. Crehan and Richard J. Fricke, both of Ridgefield, Conn.
Filed Feb. 24, 1983, Ser. No. 469,280
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.³ C08L 1/00; C08J 9/00
U.S. Cl. 521—107 10 Claims

1. A polyurethane foam made by reacting together a polyisocyanate, a catalyst, a cellulosic material, and an aqueous solution of a carbohydrate.

4,521,545
LATENT CATALYSTS FOR THE ISOCYANATE POLYADDITION REACTION
Dimitrios Kerimis, Cologne; Rudolf Hombach, Leverkusen; Peter Müller, Odenthal-Blecher, and Manfred Dollhausen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Jul. 19, 1984, Ser. No. 632,178
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1983, 3328661
Int. Cl.³ C08G 18/14
U.S. Cl. 521—107 9 Claims

1. A composition which is storage stable at room temperature which crosslinks very quickly when exposed to a temperature of 60° C. or higher comprising:
(a) an organic polyisocyanate,
(b) a compound containing at least two isocyanatereactive groups and having a molecular weight of from 400 to 10,000 and
(c) an ammonium salt of an amine and alkylating ester of an acid of phosphorus latent heat-activatable catalyst.

4,521,546
GRAFT COPOLYMERS FROM VINYL MONOMERS AND POLYURETHANE OLIGOMERS AND POLYURETHANES PREPARED THEREFROM
James M. O'Connor, Clinton, and Donald L. Lickei, Wallingford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.
Continuation of Ser. No. 333,209, Dec. 21, 1981, abandoned. This application Jul. 6, 1983, Ser. No. 511,371
Int. Cl.³ C12P 7/58, 13/02; C08F 283/04
U.S. Cl. 521—137 26 Claims

1. A process for preparing a graft copolymer comprising:
(a) reacting at least one organic polyisocyanate with at least one polyol having an average equivalent weight from about 100 to about 6000 in an equivalent ratio of NCO to OH from about 1.02/1 to about 2/1 to yield an isocyanate-terminated prepolymer;
(b) reacting said isocyanate-terminated prepolymer with at least one isocyanate reactive group-containing unsaturated monomer in sufficient proportions to form a polyurethane oligomer having a final free NCO content from about 0% to about 1% by weight and having terminal reactive unsaturation; and
(c) copolymerizing said polyurethane oligomer with at least one ethylenically unsaturated monomer in the presence of at least one polyol and in the presence of a catalytically effective amount of a free radical catalyst at a temperature from about 80° C. to about 170° C. to form a dispersion of a graft copolymer of said oligomer and said monomer in a polyol medium.

4,521,547
HIGHLY FLAME RESISTANT RIGID URETHANE-ISOCYANURATE FOAM COMPOSITIONS
James J. Anderson, Richmond, Va., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Jan. 4, 1984, Ser. No. 567,996
Int. Cl.³ C08G 18/14
U.S. Cl. 521—137 9 Claims

1. A composition curable to a highly flame resistant polymer foam comprising:
I. a blowing agent;
II. a polyester polyol prepared by
(a) transesterification, with a glycol of molecular weight from about 60 to about 400, of a residue remaining after dimethyl terephthalate and methyl p-toluate have been removed from the product of oxidation of p-xylene in the preparation of dimethyl terephthalate; or
(b) esterification, with an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide, and mixtures thereof, of a carboxyl functional residue resulting from the removal of terephthalic acid from the mixture obtained by the oxidation of p-xylene in the preparation of terephthalic acid.
III. a propylene oxide adduct of a di(lower alkyl)pyrophosphoric acid;
IV. a polymeric polyisocyanate; and
V. an isocyanurate catalyst; in which the NCO:OH mole ratio is 3:1 to 6:1.

4,521,548
PREPARATION OF POLYETHER POLYOLS
Jimmie D. Christen, Lake Jackson, and Henry B. Taylor, III, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.
Filed Apr. 12, 1983, Ser. No. 484,132
Int. Cl.³ C08G 18/14
U.S. Cl. 521—167 19 Claims

1. A process for neutralizing an alkaline catalyst in a crude polyether-containing polyol comprising contacting a polyol having a hydroxyl number of at least about 175 with formic acid under reaction conditions such that the reaction products of the formic acid and the catalyst are soluble in the polyol.

4,521,549
HIGH VOLTAGE INSULATING MATERIALS
Richard J. Penneck, Lechlade, England, assignor to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 109,249, Jan. 3, 1980, Pat. No. 4,399,064, which is a continuation of Ser. No. 434,126, Jan. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 81,558, Jan. 16, 1970, abandoned. This application Aug. 12, 1983, Ser. No. 522,821
Claims priority, application United Kingdom, Oct. 17, 1969, 51119
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.³ C08G 47/00; H01B 3/00; C04B 35/10
U.S. Cl. 523—173 40 Claims

1. Electrically insulating material suitable for high voltage applications which comprises one or more polymers and from about 29% to about 75% by weight of an anti-tracking filler system comprising: (a) a hydrate of alumina having a specific surface area of at least about 2 M^2/g, measured by the BET method, and (b) a compound selected from the group consisting of oxides, mixed oxides, and mixtures of oxides, wherein said compound contains at least one element selected from the group consisting of transition series elements, lanthanide series elements, and nontransuranic actinide series elements, components (a) and (b) being present in said anti-tracking filler system in amounts such that said electrically insulating material has an initial tracking voltage of at least about 2.5 kilovolts when

tested according to ASTM-D 2303-68 liquid Contaminant Inclined Plane test.

4,521,550

METHOD FOR OBTAINING STRONG ADHESIVE BONDING OF COMPOSITES TO DENTIN, ENAMEL AND OTHER SUBSTRATES

Rafael L. Bowen, Gaithersburg, Md., assignor to American Dental Association Health Foundation, Washington, D.C.

Continuation-in-part of Ser. No. 457,029, Jan. 10, 1983,. This application Jul. 25, 1983, Ser. No. 516,956

Int. Cl.³ A10N *1/02;* **A65K** *5/00;* **C09K** *3/00*

U.S. Cl. 523—116 **27 Claims**

1. A method for preparing the surface of dentin or enamel for adhesion of composite materials or resins, which method comprises:

(a) contacting with the surface of the dentin or enamel an aqueous solution comprising at least one acidic salt containing a polyvalent cation which is capable of changing valence by unit steps and which can bind to dentin or enamel surface sites, and at least one anion which forms a relatively water-insoluble precipitate or precipitates with calcium and which contains at least one carboxyl group;

(b) contacting with the surface of the dentin or enamel a solution comprising N-phenylglycine in a solvent; and

(c) contacting with the surface of the dentin or enamel a solution comprising at least one compound selected from the group consisting of (1) the addition reaction product of pyromellitic acid dianhydride and 2-hydroxyethyl methacrylate, (2) the addition reaction product of 3,3',4,4'-benzophenonetetracarboxylic dianhydride and 2-hydroxyethyl methacrylate, and (3) 4-methacryloxyethyltrimellitic anhydride.

4,521,551

DENTURE FIXATIVE COMPOSITION CONTAINING PARTIALLY NEUTRALIZED COPOLYMERS OF MALEIC ACID OR ANHYDRIDE AND ALKYL VINYL ETHERS WHICH ARE OPTIONALLY PARTIALLY CROSSLINKED

Tiang-Shing Chang, Westfield, and Lucy J. Zientek, Bayonne, both of N.J., assignors to Block Drug Company, Inc., Jersey City, N.J.

Filed Dec. 2, 1983, Ser. No. 557,737

Int. Cl.³ A61K *5/00;* **C08L** *1/28;* **C09J** *3/04, 3/14*

U.S. Cl. 523—120 **17 Claims**

1. A denture fixative composition comprising a denture fixative excipient and an effective denture fixative amount of a mixture of a water soluble partially neutralized and partially crosslinked lower alkyl vinyl ether-maleic acid or anhydride copolymer, a 1% aqueous solution of which has a pH of at least about 4.5 and said copolymer containing at least about 30% unreacted initial carboxyl groups, and at least one hydrophilic polymer, said composition developing when contacted with saliva a high degree of tack and viscous musilage and which spreads over the denture-mucosa interface to fill the gaps so as to provide a suction-type seal.

4,521,552

PROCESS FOR MAKING AN EMULSION POLYMER

Reiner Schnee, Darmstadt-Arheilgen, and Jürgen Masanek, Pfungstadt, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Feb. 11, 1983, Ser. No. 465,775

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207113

Int. Cl.³ C08L *3/00*

U.S. Cl. 523—313 **5 Claims**

1. A method for making a stable water-in-oil emulsion of a water soluble polymer, which method comprises,

(1) in a first reaction stage, producing free radicals in a stable oil-in-water emulsion comprising an aqueous solution of at least one water soluble monomer emulsified in oil in the presence of a water-in-oil emulsifier and maintaining said emulsion under conditions free of backmixing until polymerization of said monomer or monomers is initiated and then,

(2) in a second reaction stage, completing said initiated polymerization in the presence of free radical initiators while turbulently agitating said emulsion.

4,521,553

ANTI-STATIC HIGHLY-PLASTICIZED POLYVINYLCHLORIDE

Paul Fitton, Bristol, and Peter J. Holland, Frodsham, both of England, assignors to Dycem Limited, Bristol, England

Filed Apr. 13, 1984, Ser. No. 599,976

Int. Cl.³ C08K *3/04*

U.S. Cl. 523—333 **5 Claims**

1. A process for preparing a composition which comprises 99.5 to 75% by weight of highly plasticised polyvinylchloride (PVC) which consists of 15 to 45% by weight of polyvinylchloride (as herein defined) and 55 to 85% by weight of a plasticiser, and from 0.5 to 25% by weight of carbon fibres, said process comprising mixing PVC resin with an initial quantity of plasticiser under high shear conditions to obtain an initial homogeneous mixture, and blending this initial mixture with a slurry comprising carbon fibres and further plasticiser under low shear conditions to obtain a final homogeneous mixture, and curing said final homogeneous mixture.

4,521,554

POLYBUTYLENE TEREPHTHALATE MOLDING COMPOSITION WITH HIGH COLD IMPACT STRENGTH AND AMENABLE TO THERMOPLASTIC PROCESSING

Michael Dröscher, Dorsten; Christian Gerth, Haltern, and Klaus Burzin, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,645

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 3306008

Int. Cl.³ C08L *67/02*

U.S. Cl. 523—522 **14 Claims**

1. A thermoplastically processable molding composition of high cold impact strength, comprising

(A) 66–95% by weight of polybutylene terephthalate of a viscosity number (J), according to DIN [German Industrial Standard] 16 779, Part 2, of 70 to 240 cc/g, and

(B) 34–35% by weight of the addition reaction product of

(a) 99–75% by weight, based on the total weight of component (B), of an ethylene/α-olefin/diene terpolymer comprising 45–75 percent by weight of ethylene, 20–45 percent by weight of a C_{3-8}-α-olefin, and 2–10 parts by weight of a C_5–C_{20}-cyclic or acyclic unconjugated alkane diene, wherein the terpolymer has a Mooney viscosity, ML 1+4 at 100° C., measured according to DIN 53 523, of 30–130, and

(b) 1–25% by weight, based on the total weight of component (B), of bicyclo[2,2,2]-2,3;5,6-dibenzooctadiene-(2,5)-dicarboxylic acid-(7,8)-anhydride.

4,521,555

PLASTISOLS HAVING CARBON DUST FILLERS

Rainer Blum, Ludwigshafen-Edigheim; Max Seitz, Münster-Wolbeck, and Friedrich Kaczinski, Münster, all of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 368,309, Apr. 14, 1982, Pat. No. 4,444,837, which is a continuation-in-part of Ser. No. 106,859, Dec. 26, 1979, abandoned. This application Jan. 13, 1984, Ser. No. 570,307

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2855919

Int. Cl.³ C08K *3/04*

U.S. Cl. 524—63 6 Claims

1. A plastisol comprising a dispersion of fine-particulate synthetic resin in plasticizers, said fine particulate synthetic resin comprising a vinylchloride homopolymer, a copolymer of vinylchloride and another vinyl compound selected from the group consisting of vinylidene chloride, vinyl acetate, and vinyl propionate, said plastisol having a specific gravity of about 1.1 to 1.3 and containing 9 to 90% by weight of a filler consisting essentially of coke dust, coal dust, or mixtures thereof having a particle size of about 0.5 to 1000 microns.

4,521,556

COLORED POLYESTER COMPOSITIONS

L. Jane Adams, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 575,242, Jan. 30, 1984, abandoned. This application Jul. 16, 1984, Ser. No. 631,287

Int. Cl.³ C08K *5/16*

U.S. Cl. 524—88 9 Claims

1. Colored polyester compositions comprising: (1) a linear thermoplastic polyester derived from

(a) a diol, wherein at least a major portion of which is ethylene glycol, and

(b) crude terephthalic acid containing at least one impurity selected from the group consisting of about 1,000 to about 10,000 parts 4-carboxybenzaldehyde, about 1,000 to about 10,000 parts p-toluic acid, about 0 to about 11,000 parts benzoic acid, and about 20 to about 300 parts cobalt, said parts being per million parts of polyester, wherein at least one of said impurities is a color-forming impurity, and (2) a color-forming component comprising a coloring amount of one or more colorants compatible with said polyester.

4,521,557

FLAME RETARDANT COPOLYETHERESTERS

James M. McKenna, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

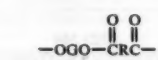
Filed Jun. 23, 1983, Ser. No. 507,206

Int. Cl.³ C08K *5/34*

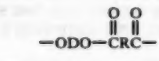
U.S. Cl. 524—94 10 Claims

1. A flame retardant copolyetherester elastomer composition which comprises

(a) a copolyetherester elastomer consisting essentially of 10–75% by weight long-chain ester units having the general formula



and 25–90% by weight short-chain ester units having the general formula



wherein R is a divalent radical remaining after removal of carboxyl groups from an aromatic dicarboxylic acid having a molecular weight less than about 300; D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 250; and G is a divalent radical remaining after removal of terminal hydroxyl groups from a poly(alkylene oxide)glycol having a carbon to oxygen ratio of about 2.0–4.3 and a number average molecular weight of 400–4000,

(b) about 15–35 parts per hundred parts copolyetherester of N,N-ethylenebis(tetrabromophthalimide),

(c) about 0.25–0.75 parts of antimony trioxide per part of N,N'-ethylenebis(tetrabromophthalimide), and

(d) about 2–20 parts per hundred parts of copolyetherester elastomer of fumed colloidal silica.

4,521,558

RUBBER-METAL ADHESION PROMOTERS

Syed K. Mowdood, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 27, 1984, Ser. No. 584,180

Int. Cl.³ C08K *5/52*

U.S. Cl. 524—145 9 Claims

1. A composite comprising a rubber composition with a metal reinforcing element embedded therein, wherein said rubber composition contains from about 0.05 to about 10 parts per hundred parts of rubber by weight of at least one adhesion promoter selected from the group consisting of allyl phosphite esters and allyl phosphate esters.

4,521,559

PHENOLIC ANTIOXIDANTS

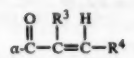
Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 349,358, Feb. 16, 1982, Pat. No. 4,414,408, which is a continuation of Ser. No. 192,583, Sep. 30, 1980, abandoned, which is a continuation of Ser. No. 24,752, Mar. 28, 1979, abandoned, which is a continuation of Ser. No. 525,440, Nov. 20, 1974, abandoned. This application Jun. 27, 1983, Ser. No. 507,822

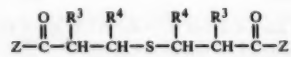
Int. Cl.³ C08K *5/36*

U.S. Cl. 524—289 8 Claims

1. A polymer composition containing an antioxidant amount of at least one compound comprising the reaction product of a polyphenolic selected from the group consisting of:
2,2'-methylene-bis-(4-methyl-6-tert.-butylphenol);
2,2'-methylene-bis-(4-ethyl-6-tert.-butylphenol);
2,2'-thio-bis-(4-methyl-6-tert.butylphenol);
2-(3,5-ditert.-butyl-4-hydroxybenzyl)-4-methylphenol;
2-(3,5-ditert.-butyl-4-hydroxybenzyl)phenol;
2-(3,5-ditert.-butyl-4-hydroxybenzyl)-5-methylphenol and 2-(3,5-ditert.-butyl-4-hydroxybenzyl)-4-isopropylphenol;
with an ester forming compound of the structural formula:



which is then joined through a sulfur atom to form compounds having the structural formula:



wherein Z is a phenoxy radical derived from the group of polyphenolics listed herein: R^3 R^4 are selected from the group consisting of hydrogen and alkyl radicals of 1 to 2 carbon atoms and α is selected from the group consisting of chlorine, iodine and bromine.

4,521,560

THERMOPLASTIC POLYESTER MOULDING COMPOSITION CONTAINING FLAME RETARDANT AND MAGNESIUM SULFATE

Franz Breitenfellner, Bensheim, Fed. Rep. of Germany, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 378,300, May 14, 1982, abandoned. This application Jun. 30, 1983, Ser. No. 509,502

Claims priority, application Switzerland, May 25, 1981, 3406/81

Int. Cl.³ C08K *3/30, 5/06*

U.S. Cl. 524—371 **10 Claims**

1. A thermoplastic polyester moulding composition which comprises, based on the total composition,

(a) 40 to 95% by weight of a thermoplastic polyester,

(b) 5 to 60% by weight of finely particulate calcined magnesium sulfate, and

(c) 3 to 25% by weight, based on the polyester, of a flameproofing additive, which is a mixture of decabromodiphenyl oxide and antimony trioxide.

4,521,561

VINYL ACETATE/ETHYLENE COPOLYMER EMULSIONS EXHIBITING BOTH PARTIALLY- AND FULLY-HYDROLYZED POLYVINYL ALCOHOL COMPATIBILITY

Mary L. Hausman, Barto, and William E. Lenney, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 29, 1984, Ser. No. 584,589

Int. Cl.³ C08F *2/30, 18/08;* **C08L** *31/04*

U.S. Cl. 524—459 **13 Claims**

1. In a vinyl acetate/ethylene copolymer emulsion comprising an aqueous colloidal dispersion of a copolymer at 40 to 60 wt% solids and containing 60 to 95 wt% vinyl acetate and 5 to 40 wt% ethylene prepared by the emulsion polymerization of vinyl acetate and ethylene in the presence of a polyvinyl alcohol, the improvement for providing a vinyl acetate/ethylene copolymer emulsion that exhibits both partially- and fully-hydrolyzed polyvinyl alcohol compatibility and enhanced plasticizer thickening which comprises performing the copolymerization in the presence of a stabilizing amount of a polyvinyl alcohol stabilizing system consisting essentially of a polyvinyl alcohol having a 3 to 6 mole% vinyl acetate content and a polyvinyl alcohol having a 10 to 14 mole% vinyl acetate content in a ratio that yields about an 8 to 10 mole% average residual vinyl acetate content.

4,521,562

POLYCARBONATE RESIN IMPACT MODIFIED WITH POLYOLEFINS AND CONTAINING PARAFFIN DERIVATIVES

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Continuation of Ser. No. 221,706, Dec. 31, 1980, abandoned. This application Jul. 13, 1982, Ser. No. 397,718

Int. Cl.³ C08L *69/00;* **C08K** *5/10*

U.S. Cl. 524—490 **4 Claims**

1. A polycarbonate composition comprising in admixture, a high molecular weight aromatic carbonate polymer and a minor amount of a polyolefin and a paraffin of the following formula:

$$C_nH_{2n+1}R$$

wherein n has a value of from about 8 to about 60, and which is characterized by a straight or branched carbon chain and R is H or a carboxylic acid ester which is unreactive with polycarbonate, said polyolefin and paraffin derivative in quantities which reduce the melt viscosity and provide better impact resistance after aging at elevated temperature than either the polyolefin or paraffin derivative alone, said polyolefin derivative present from about 3.5 to about 8.0 parts per hundred parts of aromatic carbonate polymer and said paraffin derivative present in from about 0.1 to about 1.5 parts per hundred parts of aromatic carbonate polymer.

4,521,563

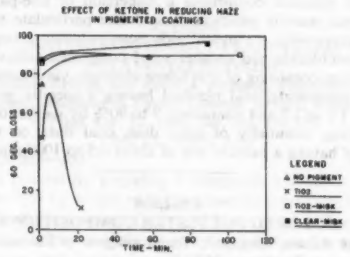
LOW TEMPERATURE CURE, PIGMENTED COATED COMPOSITION

Howard R. Lucas, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.

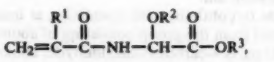
Continuation-in-part of Ser. No. 529,238, Sep. 6, 1983, abandoned. This application Oct. 30, 1984, Ser. No. 665,513

Int. Cl.³ C08J *39/00;* **C08K** *39/00*

U.S. Cl. 524—555 **12 Claims**



1. A low temperature cure, pigmented coating composition comprising (a) a crosslinkable, solvent borne, solution polymer containing from about 1 to 100 weight percent of repeating units derived from an activated ester-containing vinyl monomer of the formula



wherein the R^1 group is selected from H and CH_3, the R^2 group is selected from alkyis of 1–6 carbon atoms, cycloalkyls of 5–6 carbon atoms, and 2-hydroxyalkyls of 2–6 carbon atoms, and the R^3 group is selected from alkyls of 1–6 carbon atoms, cycloalkyls of 5–6 carbon atoms, and 2-hydroxyalkyls of 2–6 carbon atoms; with any balance of repeating units derived from one or more copolymerizable ethylenically unsaturated comonomers; combined with (b) an amine/aminal equilibrium mixture, the equilibrium being between a crosslinking agent having a plurality of primary amine groups, each capable when in the free amine form of replacing the OR^3 moiety by nucleophilic substitution, and a hemiaminal formed from a hemiaminal-forming, volatile ketone and said crosslinking agent; said hemiaminal being present in an amount sufficient to produce a crosslinked polymer when said primary amine groups are in said free amine form;

wherein the coating composition contains a sufficient amount of pigment for a coating prepared therefrom to manifest improved gloss.

4,521,564

COVALENT BONDED ANTITHROMBOGENIC POLYURETHANE MATERIAL

Donald D. Solomon, Spring Valley; Charles W. McGary, Centerville, and Vincent J. Pascarella, Dayton, all of Ohio, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 10, 1984, Ser. No. 578,909

Int. Cl.³ C08H *1/00;* **A61F** *1/00;* **C08B** *37/10*

U.S. Cl. 525—54.1 **23 Claims**

1. An antithrombogenic polyurethane polymer which comprises:

(a) a polyurethane substrate;

(b) a polymeric amine selected from the group of a polyvinyl

amine, a polyalkylenimine having 2 to 4 carbon atoms per amine unit and mixtures thereof covalently bonded to said polyurethane substrate; and

(c) an antithrombogenic agent covalently bonded to said polymeric amine.

2. The antithrombogenic polyurethane polymer of claim 1 wherein the antithrombogenic material is selected from the group consisting of heparin, prostaglandins, urokinase, streptokinase, sulfated polysaccharide, albumin and mixtures thereof.

4,521,565

AQUEOUS DISPERSION

Hirotaka Toaba, Ohimachi; Masatoshi Mikumo, Kamiitabashi, and Masahiro Asami, Ohimachi, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 337,336, Jan. 6, 1982, Pat. No. 4,415,703. This application Aug. 10, 1983, Ser. No. 521,866

Claims priority, application Japan, Jan. 13, 1981, 56-3506; Jan. 13, 1981, 56-3507; Apr. 16, 1981, 56-57500; Aug. 28, 1981, 56-135939

Int. Cl.³ C08G *59/02*

U.S. Cl. 525—64 **12 Claims**

1. An aqueous coating composition comprising a mixture of:

(A) a hydrophilic epoxy compound having at least two epoxy groups in the molecule, and

(B) an aqueous dispersion which dispersion has been prepared by emulsion polymerizing, under radical polymerization conditions, at least one radical-polymerizable, ethylenically unsaturated monomer I, in the presence of water and a dispersion stabilizer, said dispersion stabilizer being a high molecular weight polymeric product consisting essentially of a hydrophilic polymer chain portion and an oleophilic polymer chain portion which is highly compatible with the polymer of monomer I, so that said oleophilic polymer chain portion is entangled with the particles of the polymer of said monomer I in the composition, and said hydrophilic polymer chain portion is present in the aqueous phase of the composition, said dispersion stabilizer having functional groups reactive with the epoxy groups of said hydrophilic epoxy compound.

4,521,566

POLYPROPYLENE COMPOSITIONS HAVING IMPROVED IMPACT STRENGTH PROPERTIES AT LOW TEMPERATURES AND PROCESS FOR PREPARING SAME

Paolo Galli, and Mario Spataro, both of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Oct. 13, 1982, Ser. No. 434,110

Claims priority, application Italy, Oct. 14, 1981, 24475 A/81

Int. Cl.³ C08F *297/08;* **C08L** *23/16*

U.S. Cl. 525—247 **2 Claims**

1. A polypropylene composition having a high impact strength

at low temperatures, comprising:

(A) 100 parts by weight of polypropylene having an isotacticity index higher than 90;

(B) 8–25 parts by weight of a copolymeric fraction soluble in xylene at 23° C. consisting of an amorphous ethylene-propylene copolymer containing from 20 to 80% by weight of ethylene;

(C) 2–10 parts by weight of a fraction consisting of a crystalline ethylene-propylene copolymer exhibiting a polyethylene type crystallinity and containing from 50 to 90% by weight of ethylene;

the total content of polymerized ethylene in said composition ranging from 4 to 20% by weight and the ratio by weight of total polymerized ethylene to fraction (B) being lower than 1.

2. A process for producing a composition according to claim 1 by polymerization of propylene and ethylene-propylene mixtures either continuously or discontinuously in consecutive steps including at least a step of stereoregular homopolymerization of propylene and a step of copolymerization of ethylene-propylene mixtures, which comprises carrying out the polymerization by the aid of a stereospecific coordination catalyst comprising a titanium compound supported on a magnesium dihalide in an active form having a surface area larger than 3 m^2/g and/or having an X-ray spectrum in which the line of maximum intensity appearing in the spectrum of nonactivated magnesium dihalde is broadened or substituted by a halo, under conditions in which in the homopolymerization step a polypropylene having an isotacticity index higher than 90 is formed in an amount ranging from 65 to 90% by weight of the final product, in the copolymerization step the conditions are selected so that an amorphous ethylene-propylene copolymer extractable with xylene at 23° C. is formed in such an amount that the ratio by weight of the total polymerized ethylene to such amorphous copolymer is lower than 1, and the total content of polymerized ethylene in the final product ranges from 4 to 20% by weight.

4,521,567

METHOD FOR MAKING IMPACT RESISTANT MOLDING COMPOSITIONS

Peter J. Arndt, Seeheim-Jugenheim; Walter Ludwig, Bensheim-Auerbach; Manfred Munzer, Bensheim; Werner Siol, and Franz Wenzel, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 637,863

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 3329765

Int. Cl.³ C08L *51/00;* **C08F** *265/04, 265/06*

U.S. Cl. 525—261 **21 Claims**

1. A method for making an impact resistant molding composition, which method comprises polymerizing, in a first stage, a monomer mixture comprising from 70 to 100 percent by weight of methyl methacrylate, 0 to 30 percent by weight of an ester formed between acrylic acid and an aliphatic alcohol having from 1 to 8 carbon atoms and/or an ester formed between methacrylic acid with an alcohol having from 2 to 8 carbon atoms, and from 0 to 10 percent by weight of at least one further different vinyl monomer copolymerizable with the aforementioned comonomers, to form a hard phase polymer having a glass transition temperature above 25° C., the polymerization in said first stage being carried out in the presence of an oil soluble free radical initiator and of an organosulfur chain transfer agent having at least two thiol groups per molecule, and then in a second stage adding, to said hard phase polymer, monomers forming a rubbery phase and further polymerizing the mixture of monomers and polymer to completion in the presence of a graft crosslinking agent, the monomers of said rubbery phase being monomers the homopolymers of which have a glass transition temperature below 25° C.

4,521,568

SEQUENTIALLY PRODUCED MULTILAYER ACRYLIC RESIN COMPOSITION

Kyoichiro Mori, Tokyo, and Hiroyuki Hirano, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Jun. 1, 1982, Ser. No. 383,567

Claims priority, application Japan, Jun. 3, 1981, 56-84307

Int. Cl.³ C08F *265/06*

U.S. Cl. 525—309 **11 Claims**

1. A sequentially produced multilayer acrylic resin composition which comprises:

(A) a relatively hard first stage layer having a glass transition temperature of at least 25° C., polymerized from methyl methacrylate alone or a monomer mixture comprising a predominant proportion of methyl methacrylate by an emulsion polymerization process;

(B) a relatively soft second stage layer, polymerized in the presence of a product containing the relatively hard first

stage layer from a monomer mixture comprising (B-1) a predominant proportion of at least one alkyl acrylate, (B-2) a minor proportion of at least one monomer selected from the group consisting of copolymerizable monoethylenically unsaturated monomers and copolymerizable polyfunctional crosslinking monomers, and (B-3) 0.1% to 5.0% by weight, based on the weight of the monomer mixture, of a polyfunctional graftlinking monomer by an emulsion polymerization process; said relatively soft second stage layer being characterized as exhibiting a glass transition temperature of not higher than 25° C. if the monomer mixture is polymerized in the absence of the product of the relatively hard first stage layer; and

(C) a relatively hard third stage layer, polymerized in the presence of a product containing the relatively soft second stage layer and the relatively hard first stage layer from methyl methacrylate alone or a monomer mixture comprising a predominant proportion of methyl methacrylate; said relatively hard third stage layer being characterized as exhibiting a glass transition temperature of at least 25° C. if the monomer or monomer mixture is polymerized in the absence of the product containing the relatively soft second stage layer and the relatively hard first stage layer, and further characterized as having decreasing molecular weights from the innermost portion to the outermost portion.

4,521,569

IMPACT STYRENE POLYMER

Robert A. Bubeck, and Charles B. Arends, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 497,942, May 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 225,297, Jan. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 136,583, Apr. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 25,126, Mar. 29, 1979, abandoned. This application Dec. 19, 1983, Ser. No. 562,922

Int. Cl.³ C08K *5/01*

U.S. Cl. 525—316 **3 Claims**

1. In a process for the preparation of an impact resistant alkenyl aromatic polymer wherein a stream is provided, the stream containing a polymerizing alkenyl aromatic monomer, a reinforcing rubber dissolved therein, initiating polymerization of the alkenyl aromatic monomer either thermally or by a free radical generating initiator in the presence of dissolved rubber to cause the rubber to form a plurality of rubber particles, therein subsequently polymerizing an additional amount of the alkenyl aromatic monomer to form alkenyl aromatic resinous polymer having a desired amount of rubber dispersed therethrough as a plurality of particles, and subsequently removing from the stream at least a major portion of the unreacted alkenyl aromatic monomer and organic solvent, the improvement which comprises employing as the solvent from about 2 to about 20 weight percent based on the total weight of the stream, an aliphatic hydrocarbon composition having a solubility parameter from about 6 to about 7.7 and boiling within the range of 99° C. to 170° C., to thereby provide a polymer with improved resistance to cracking under stress in the presence of oil.

4,521,570

MODIFIED EPOXY RESIN AND COMPOSITION

Shoji Watanabe; Kimio Inoue, and Kiyoshi Okitsu, all of Obtake, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 385,211, Jun. 4, 1982, abandoned. This application Mar. 1, 1984, Ser. No. 583,794

Claims priority, application Japan, Jun. 19, 1981, 56-94876; Aug. 20, 1981, 56-131377

Int. Cl.³ C08L *67/04*

U.S. Cl. 525—415 **11 Claims**

1. A lactone-modified epoxy resin which is the reaction product obtained by effecting ring-opening polymerization of from 3 to 95 parts by weight of ε-caprolactone, in the presence of from 97 to 5 parts by weight of an epoxy resin having terminal unreacted epoxy groups and having at least one hydroxyl group in the epoxy resin molecule, at a temperature of from 100° to 240° C., in the presence of a catalytically effective amount of a catalyst effective for polymerizing ε-caprolactone and selected from the group consisting of titanium compounds, organotin compounds and stannous halides, the conditions being effective to form poly(ε-caprolactone) as a side chain bonded to the epoxy resin molecule at the location of said hydroxyl group or groups, said poly(ε-caprolactone) side chain having a terminal primary hydroxyl group at the end thereof remote from said epxoy resin molecule.

4,521,571

PROCESS FOR PREPARING POLYESTER ELASTOMERS

Takatsugu Ishido, and Takeshi Horikawa, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Jul. 11, 1984, Ser. No. 630,451

Claims priority, application Japan, Jul. 25, 1983, 58-135385

Int. Cl.³ C08G *63/76*

U.S. Cl. 525—437 **12 Claims**

1. A process for preparing a polyester elastomer which comprises the step of polymerizing a dicarboxylic acid containing mainly an aromatic dicarboxylic acid, or an ester-forming derivative thereof, with a low molecular weight glycol containing mainly 1,4-butanediol and a polyoxyalkylene glycol, at least 10 wt. % of the polyoxyalkylene glycol being a poly (oxy-2-methyl-1,3-propylene)diol.

9. A polyester elastomer which has been obtained by a process as defined in claim 1.

4,521,572

EPOXY RESIN MODIFIED POLYETHER POLYOLS FROM MIXED INITIATORS

Michael Cuscurida, and Bruce W. Peterson, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 22, 1984, Ser. No. 582,241

Int. Cl.³ C08L *61/14*; C08G *65/08*

U.S. Cl. 525—507 **20 Claims**

1. A modified mixed initiator polyol being produced by the process comprising

reacting a mixture of initiators comprising 60 to 90 wt.% of a trifunctional partially alkoxylated initiator and 10 to 40 wt.% of a secondary partially alkoxylated initiator having an active hydrogen functionality of from 4 to 8 with an epoxy resin having an average of at least 1.8 reactive 1,2-epoxy groups per molecule and one or more alkylene oxides in such a manner that the epoxy resin is added internally along the length of the polyol chain.

4,521,573

CATALYST IMPREGNATED ON FINE SILICA, PROCESS FOR PREPARING, AND USE FOR ETHYLENE POLYMERIZATION

Kiu H. Lee, South Charleston, W. Va., and Gary S. Cieloszyk, Somerville, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 163,959, Jun. 30, 1980, Pat. No. 4,405,495. This application Jul. 25, 1983, Ser. No. 516,932

Int. Cl.³ C08F *4/02*, *210/02*

U.S. Cl. 526—125 **14 Claims**

1. In a process for producing ethylene copolymer containing ≧90 mol percent of ethylene and ≦10 mol percent of one or more C_3 to C_8 alpha olefins wherein said copolymer is produced in granular form at a density of ≧0.91 to ≦0.94 with a Ti containing catalyst at a productivity level of ≧5 ppm of titanium per million parts of copolymer by a process which comprises copolymerizing ethylene with at least one C_3 to C_8

alpha olefin in a reactor at a temperature of about 30° to 105° C. under a pressure of up to about 1000 psi in the gas phase by contacting the monomer charge with, in the presence of about 0 to 2.0 mols of hydrogen per mol of ethylene in the gas phase reaction zone, particles of a catalyst composition comprising a precursor composition of the formula

$$Mg_mTi_1(OR)_nX_p[ED]_q$$

wherein R is a C_1 to C_{14} aliphatic or aromatic hydrocarbon radical, or COR' wherein R' is a C_1 to C_{14} aliphatic or aromatic hydrocarbon radical,
X is selected from the group consisting of Cl, Br, I or mixtures thereof,
ED is an electron donor compound,
m is $\geqq 0.5$ to $\leqq 56$,
n is 0, 1 or 2,
p is $\geqq 2$ to $\leqq 116$, and
q is $\geqq 2$ to $\leqq 85$,
said precursor composition being impregnated in a porous support in a weight ratio of 0.1:1 to 0.33:1 and being
first partially activated outside of said reactor with >0 to <10 mols of activator compound per mol of Ti in said precursor composition, and
then completely activated in said reactor with $\geqq 10$ to $\leqq 400$ mols of activator compound per mol of Ti in said precursor composition,
said activator compound having the formula

$$Al(R'')_cX'_dH_e$$

wherein X' is Cl or OR''', R'' and R''' are the same or different and are C_1 to C_{14} saturated hydrocarbon radicals, d is 1 to 1.5, e is 1 or 0 and c+d+e=3,
said electron donor compound being a liquid organic compound in which said precursor composition is soluble and which is selected from the group consisting of alkyl esters of aliphatic and aromatic carboxylic acids, aliphatic ethers, cyclic ethers and aliphatic ketones,
the improvement which comprises employing as said support throughout the polymerization silica having a particle size distribution within the range of from 2 microns to 80 microns and an average particle size of from 20 microns to 50 microns.

4,521,574

INCORPORATION OF FUNCTIONALIZED MONOMERS

Dennis B. Patterson, Akron; Dane K. Parker, Massillon, and Lloyd D. Hess, Jr., Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 27, 1984, Ser. No. 584,054
Int. Cl.³ C08F 2/26
U.S. Cl. 526—204 **8 Claims**

1. A process for forming a polymer comprising the aqueous emulsion polymerization of:
(A) at least one functionalized monomer that contains a polymerizable vinyl group; with
(B) at least one copolymerizable conjugated diene monomer selected from the group consisting of butadiene-1,3, 2-chlorobutadiene-1,3, isoprene, piperylene and conjugated hexadienes; and optionally
(C) at least one vinyl monomer selected from the group consisting of styrene, α-methylstyrene, divinylbenzene, vinyl chloride, vinyl acetate, vinylidene chloride, methyl methacrylate, ethyl acrylate, vinylpyridine, acrylonitrile, methacrylonitrile, methacrylic acid and acrylic acid;
the ratio of functionalized monomer to conjugated diene to vinyl monomer can range from 5:75:20 to 95:5:0 parts per hundred based on total monomers;
the improvement which comprises polymerizing the monomers in the presence of from 8 to 30 parts of an ionic soap per 100 parts of total organic components, (monomers and cosolvents) and 40–80 parts of dichloromethane, tetrahydrofuran or combinations thereof based on 100 parts of total monomers.

4,521,575

TETRAFLUOROETHYLENE-ETHYLENE TYPE COPOLYMER

Shinichi Nakagawa, Nara, and Kiyohiko Ihara, Osaka, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 2, 1984, Ser. No. 576,426
Claims priority, application Japan, Feb. 12, 1983, 58-21808; Feb. 12, 1983, 58-21809
Int. Cl.³ C08F 210/02, 214/18
U.S. Cl. 526—206 **19 Claims**

1. A copolymer comprising 40 to 60% by mole of monomeric units of tetrafluoroethylene, 60 to 40% by mole of monomeric units of ethylene and 0.1 to 20% by mole of monomeric units of at least one monomeric compound selected from the group consisting of 2-trifluoromethylpropylene and 2-methyl-1,1,3,3,3-pentafluoropropylene.

4,521,576

CONTINUOUS POLYMERIZATION OF CHLOROPRENE

Rüdiger Musch, Bergisch Gladbach; Wilhelm Göbel, Leverkusen; Wolfgang Konter, Neuss, and Wilfried Nolte, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 354,790, Mar. 4, 1982, abandoned, which is a continuation of Ser. No. 201,920, Oct. 29, 1980, abandoned. This application Nov. 30, 1983, Ser. No. 556,580
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1980, 3002711
Int. Cl.³ C08F 36/18, 20/20
U.S. Cl. 526—213 **9 Claims**

1. Process for the continuous polymerization of chloroprene or chloroprene with up to 50% by weight of one or more comonomers which are copolymerization with chloroprene in an aqueous alkaline emulsion at 0° to 70° C. to a monomer conversion of at most 85% and followed by working-up latices to solid rubbers,
wherein the aqueous emulsion contains from 0.4 to 0.9 parts by weight of potassium hydroxide, from 2.8 to 3.3 parts by weight of a potassium salt of disproportionated abietic acid, from 0.4 to 0.8 parts by weight of condensation products of naphthalene sulphonic acid and formaldehyde, and 100 to 130 parts by weight of water, all quantities being based on 100 parts by weight of monomer, and in the absence of polymeric fatty acids.

4,521,577

LIQUID POLYMERIZABLE COMPOSITIONS OF A CARBONATE OLIGOMER, AN ALLYLCARBONATE AND VINYL ACETATE

Ugo Romano, Vimercate; Fiorenzo Renzi, Gorgonzola; Franco Rivetti, Schio, and Claudio Gagliardi, S.Donato Milanese, all of Italy, assignors to Enichimica S.p.A., Milan, Italy

Filed Jan. 6, 1984, Ser. No. 568,726
Claims priority, application Italy, Jan. 13, 1983, 19085 A/83
Int. Cl.³ C08F 218/00
U.S. Cl. 526—261 **7 Claims**

1. A liquid polymerizable composition having outstanding mechanical and optical properties, comprising:
(a) from 10% to 90% by weight of oligomer of the formula

$$CH_2{=}CH{-}CH_2{-}O{-}\underset{\underset{O}{\|}}{C}{-}O(R{-}O{-}\underset{\underset{O}{\|}}{C}{-}O)_n{-}CH_2CH{=}CH_2$$

wherein R is the residue of diethylene glycol and n is varied from 2 to 10, said oligomer being obtained by

reacting diallylcarbonate with diethylene glycol in a molar ratio of the former to the latter of about 2:1;

(b) a compound selected from the group consisting of bis(allylcarbonate) of diethylene glycol; bis(allylcarbonate) of bis(hydroxymethyl)tricyclodecane; bis(allylcarbonate) of 1,4-butanediol; bis(allylcarbonate) of cyclohexanedimethanol; and tris(allylcarbonate) of tris(hydroxyethyl-)isocyanurate said compounds being obtained by reaction of diallylcarbonate with an alcohol selected from the group consisting of diethylene glycol; bis(hydroxymethyl)tricyclohexanedimethanol; or tris(hydroxyethyl-)isocyanurate, respectively, in a molar ratio of diallylcarbonate to alcohol of about 12:1; or a member of the group consisting of diallyl terephthalate and triallylcyanurate; and

(c) vinyl acetate.

4,521,578

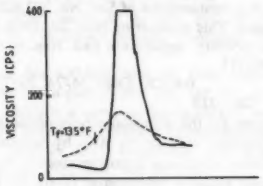
COMPOSITION AND METHOD OF PREPARATION OF NOVEL AQUEOUS DRILLING FLUID ADDITIVES

Robert G. Chen; Arvind D. Patel, and Thomas E. Sample, Jr., all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 26, 1983, Ser. No. 536,464

Int. Cl.³ C08F *12/30, 4/06, 4/46*

U.S. Cl. 526—288 **27 Claims**



1. A water-soluble terpolymer having utility as a stabilizer and deflocculant for aqueous drilling fluids comprising the reaction product of:

(a) 5 to 50% by weight of a salt of tetrahydrophthalic acid;

(b) 10 to 70% by weight of acrylic monomer; and

(c) 5 to 50% by weight of a salt of 2-acryl-amido-2-methylpropane sulfonic acid.

5. A water-soluble graft copolymer having utility as a stabilizer and deflocculant for aqueous drilling fluids comprising:

(a) 5 to 70% by weight of lignosulfonate;

(b) 5 to 50% by weight of a salt of tetrahydropthalic acid;

(c) 10 to 70% by weight of acrylic monomer; and

(d) 5 to 50% by weight of a salt of 2-acryl-amido-2-methylpropane sulfonic acid.

4,521,579

HIGH MOLECULAR WEIGHT WATER-SOLUBLE POLYMERS USEFUL IN DEOILING SAND AND ROCK MASSES

Friedrich Engelhardt; Hermann Schmitz, both of Frankfurt am Main; Walter Gulden, Hofheim, and Jörg Hax, Wiesbaden, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

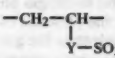
Continuation of Ser. No. 283,497, Jul. 15, 1981, abandoned. This application Mar. 29, 1983, Ser. No. 480,010

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027422

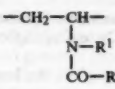
Int. Cl.³ C08F *228/02*

U.S. Cl. 526—287 **5 Claims**

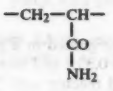
1. Water-soluble copolymers which consist essentially of a random distribution of 5 to 60% by weight of units of the formula



2 to 40% by weight of units of the formula



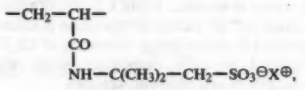
and 38 to 93% by weight of units of the formula



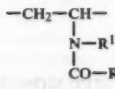
and partial hydrolysates thereof,

wherein when R^1 is hydrogen, R^2 is hydrogen, methyl or ethyl, Y is —CO—NH—$C(CH_3)_2$—CH_2— or a direct bond, and $X^{\oplus}$ is a cation; when R^1 and R^2 are identical or different, each is hydrogen, methyl, ethyl or, together with trimethylene, Y is —CO—NH—$C(CH_3)_2$—CH_2— and $X^{\oplus}$ is a cation;

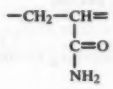
with the proviso that the water-soluble copolymers may not consist of a random distribution 5 to 60% by weight of units of the formula



5 to 40% by weight of units of the formula



38 to 80% by weight of units of the formula

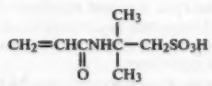


wherein R^1 and R^2 are identical or different and each is hydrogen, methyl or ethyl

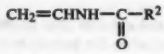
and $X^{\oplus}$ is a cation,

produced by Trommsdorff-Norrish copolymerizing at 0° to 130° C. an aqueous mixture of monomers selected from

(a) 5 to 60 parts by weight of 2-acrylamido-2-methylpropanesulfonic acid of the formula

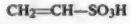


wherein the sulfonic acid is neutralized with base, 2 to 40 parts by weight of a vinylacylamide of the formula

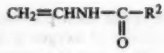


and 38 to 93 parts by weight of acrylamide,

(b) 5 to 60 parts by weight of vinylsulfonic acid of the formula

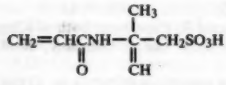


wherein the sulfonic acid is neutralized with base, 2 to 40 parts by weight of a vinylacylamide of the formula

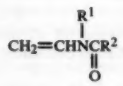


and 38 to 93 parts by weight of acrylamide, and

(c) 5 to 60 parts by weight of 2-acryl-2-amido-2-methylpropanesulfonic acid of the formula



wherein the sulfonic acid is neutralized with base, 2 to 40 parts by weight of a vinylacylamide of the formula



and 38 to 93 parts by weight of acrylamide, with the proviso that vinylsulfonic acid is a reactant, or said vinylacrylamide is a reactant in an amount of 2 to 5 parts by weight, or acrylamide is a reactant in an amount of 80 to 93 parts by weight.

4,521,580

MICROEMULSION PROCESS FOR PRODUCING ACRYLAMIDE-ALKYL ACRYLAMIDE COPOLYMERS

S. Richard Turner, Rochester, N.Y.; Donald B. Siano, Fanwood, and Jan Bock, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 454,238, Dec. 29, 1982, abandoned. This application Aug. 29, 1983, Ser. No. 526,990

Int. Cl.³ C08F *20/56*

U.S. Cl. 526—307.2 **10 Claims**

1. A free radical microemulsion copolymerization process for the formation of a copolymer of acrylamide and a waterinsoluble alkyl acrylamide corresponding to the formula below which comprises the steps of:

(a) forming a microemulsion concentrate which includes a surfactant, cosurfactant, and oil for hydrocarbon solvent;

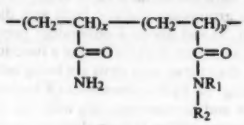
(b) dissolving the alkyl acrylamide into this concentrate;

(c) adding the water or brine containing the water soluble monomer to said concentrate to form a clear homogeneous microemulsion reaction mixture having microemulsion droplets of about 100 to 1000 A;

(d) deaerating the mixture by passage of an inert gas therethrough;

(e) adding sufficient quantity of free radical initiator to initiate copolymerization of the water soluble monomer and the water insoluble monomer; and

(f) continuing the copolymerization reaction for a sufficient time at a sufficient temperature to form said copolymer without phase separation occurring or the formation of substantial amounts of particulates, said copolymer having an intrinsic viscosity of about 1 to about 10 dl/g said copolymer having the formula:



wherein R_1 is an alkyl or cycloalkyl group having about 6 to 22 carbon atoms, R_2 is the same or different alkyl group as R_1, or hydrogen, x is about 90.0 to about 99.9 mole %, and y is about 10.0 to about 0.1 mole%.

4,521,581

POLYMER POLYOL PREPARED BY CROSSLINKING A LOW MOLECULAR WEIGHT POLYMER IN A POLYOL

Richard J. G. Dominguez, and Michael Cuscurida, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 4, 1983, Ser. No. 472,344

Int. Cl.³ C08G *18/22, 18/67;* **C08L** *75/00*

U.S. Cl. 528—57 **11 Claims**

1. A method for making polymer polyols comprising

(a) polymerizing an ethylenically unsaturated monomer with an anionic catalyst in a selected medium to a low molecular weight liquid polymer,

(b) mixing the polymer from (a) in a polyol which is different from the medium of (a), and

(c) crosslinking the polymer in the polyol.

4,521,582

THERMOPLASTIC POLYURETHANES HAVING A HIGH HEAT STABILITY, BASED ON NAPHTHYLENE DIISOCYANATE, THEIR PRODUCTION AND THEIR USE

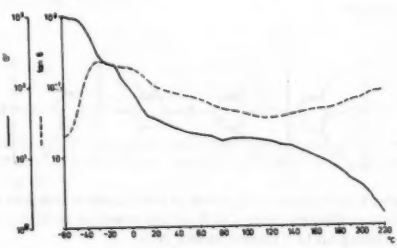
Wilhelm Goyert, and Jürgen Winkler, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 637,242

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 3329775

Int. Cl.³ C08G *18/76, 18/32*

U.S. Cl. 528—67 **22 Claims**



1. A process for the preparation of a thermoplastically processible polyurethane elastomer comprising

(i) reacting at least one substantially linear polyhydroxyl compound having a molecular weight of from about 550 to about 10,000 with a substoichiometric amount of at least one first diisocyanate to obtain an OH-prepolymer, and

(ii) reacting said OH-prepolymer with a naphthylene-1,5-diisocyanate and a chain lengthener mixture,

said first diisocyanate being any diisocyanate other than naphthylene-1,5-diisocyanate, said chain lengthener mixture

being comprised of diols and polyols having molecular weights of from 62 to 500, said chain lengthener mixture being characterized in that between about 70 and about 92 equivalent percent of its OH groups are derived from said diols and in that between about 30 and about 8 equivalent percent of its OH groups are derived from polyols having a functionality of three and/or higher than three, said diols are being selected from the group consisting of hydroquinone-di-(β-hydroxyethylether), butane diol-1,4 and hexane diol-1,6, with the proviso that in mixtures containing either butane diol-1,4 or hexane diol-1,6 such mixtures contain co-diols which provide from about 15 to about 50 equivalent percent of said OH groups which are derived from diols only, said co-diols having a molecular weight of from 62 to 500.

4,521,583

CURABLE EPOXY RESIN COMPOSITIONS

Dalip K. Kohli, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 9, 1984, Ser. No. 578,402

Int. Cl.³ C08G *59/44*

U.S. Cl. 528—119 **25 Claims**

1. A heat curable composition comprising

(a) an epoxy prepolymer or combination of prepolymers having more than one epoxide group per molecule, and

(b) a curing catalyst for said epoxy consisting essentially of

(i) an amount effective to cure said epoxy of a bisurea compound comprising the reaction product of an organic diamine with at least two moles, per mole of organic diamine, of an aryl monoisocyanate, alone, or in further combination with

(ii) an amount effective to cure said epoxy of an amine functional aromatic curing agent.

4,521,584

PROCESS FOR THE PRODUCTION OF BIFUNCTIONAL POLYPHENYLENE ETHERS

Walter Heitz, Kirchhain, and Wilhelm Risse, Marburg, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

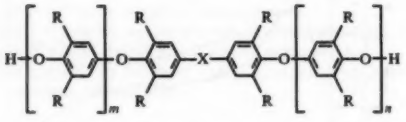
Filed Feb. 27, 1984, Ser. No. 583,652

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1983, 3308421

Int. Cl.³ C08G *65/44*

U.S. Cl. 528—214 **5 Claims**

1. A process for the production of bifunctional polyphenylene oxides:



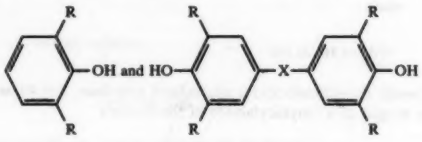
where R is the same or different at each position and is an alkyl moiety containing from 1 to 4 carbon atoms or an aryl moiety containing up to 6 carbon atoms, X is

-O-,

-S- or SO_2-, where R^1 is hydrogen or an alkyl radical containing from 1 to 4 carbon atoms, and m and n are integers of from 1 to 200, comprising,

(1) introducing a metal compound catalyst into an organic solvent and oxidizing the catalyst in the presence of oxygen; then

(2) adding a mixture of phenols,



where R is the same or different at each position, and reacting the mixture in the presence of oxygen at a temperature of from −80° C. to 100° C. and at a pressure of 0–15 bar.

4,521,585

POLYESTERS AND THEIR MANUFACTURE FROM ACIDS AND GLYCOL CARBONATES

Joelle R. Thomsen, and David R. Fagerburg, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 405,795, Aug. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 291,609, Aug. 10, 1981, abandoned. This application Jun. 30, 1983, Ser. No. 509,532

Int. Cl.³ C08G *63/00*

U.S. Cl. 528—271 **5 Claims**

1. The process for preparing prepolymer of an inherent viscosity of from about 0.008 to about 0.20 as calculated from the equation

$$(\eta)^{25°\,C.}_{0.50\%} = \frac{\ln \frac{t_s}{t_o}}{C}$$

where:

(η)=inherent viscosity at 25° C. at a polymer concentration of 0.50 g/100 ml. of solvent;

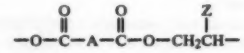
ln=natural logarithm;

t_s=sample flow time;

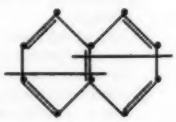
t_o=solvent-blank flow time; and

C=concentration of polymer in grams per 100 ml. of solvent =0.50,

having the same or different repeating units of the formula



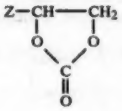
wherein A is



or mixtures thereof in any proportion, and wherein up to about

50 mole percent of A is replaced with the hydrocarbon chains of 2–18 carbons of one or more aliphatic dicarboxylic acids of a modifying acid component (ADAC) consisting of one or a mixture of aliphatic dicarboxylic acids of 4–20 carbons, and Z is H or a group selected from cyclohexyl and straight or branched alkyl of 1–6 carbons, provided that the carbon of said Z group which is attached to the

moiety contains at least one hydrogen atom bound to said carbon, said process comprising reacting one or a mixture of compounds of the formula



with one or a mixture of terephthalic acid (TPA), 1,4-cyclohexanedicarboxylic acid (CHDA), isophthalic acid (IPA), or naphthalene dicarboxylic acid (NDA), and up to about 50 mole percent of said aliphatic dicarboxylic acid component (ADAC), at a temperature of from about 150° C. to about 250° C. wherein the mole ratio of the ethylene carbonate (EC) to TPA, CHDA, or NDA is from about 1 to about 2, the mole ratio EC:IPA is from about 1 to about 1.8, the mole ratio EC:ADAC is from about 1 to about 2, and the mole ratio of the ethylene carbonate to each of the acids is from about 1.25 to about 3.0, in contact with from about 0.05 mole % to about 5.0 mole percent based on total moles of carbonate reactant of an amine component selected from one or a mixture of: trialkylamines having the formula R_3N wherein each R is an independently selected alkyl group, linear or branched of 1 to 18 carbons; tetraalkyl nitrogen substituted diamines having the formula $R^2R^3N—R^1—NR^4R^5$ wherein R^1 is straight or branched alkylene of 1–8 carbons, and each of R^2, R^3, R^4 and R^5 is independently selected from straight or branched alkyl of 1–8 carbons;

$R^2N—CH_2CH_2N'(R^3)—CH_2CH_2$, $CH_2CH_2CH_2CH_2CH_2—N—R^2$

wherein R^2 and R^3 are as defined above; or quaternary ammonium salts having the formula $(R^6)_4N^+X^-$, wherein each R^6 group is independently selected from linear or branched alkyl of 1–18 carbons, and one of which is benzyl, and wherein X^- is hydroxide or a carboxylate anion.

4,521,586

PROCESS FOR PREPARING HIGH MOLECULAR WEIGHT COMPOUNDS

Takeshi Fujita; Shigeo Mori, both of Kyoto; Hironori Kataoka, Yamatokoriyama, and Akira Taniuchi, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Mar. 17, 1983, Ser. No. 476,155

Claims priority, application Japan, Mar. 17, 1982, 57-43340; Apr. 13, 1982, 57-62164

Int. Cl.³ C08G *63/42, 63/66, 59/00*

U.S. Cl. 528—297 **7 Claims**

1. A process for preparing high molecular weight compounds which comprises addition-polymerizing an alkylene oxide containing ethylene oxide to an organic compound having at least two active hydrogens to produce a polyhydroxyl compound having an average molecular weight of not less than 1,000, and reacting said polyhydroxyl compound with an esterifying agent selected from the group consisting of polycarboxylic acids, anhydrides thereof and lower alkyl esters thereof by means of esterification or interesterification reaction at a temperature of 80° to 250° C. under a reduced pressure of 0.001 to 20 mm Hg to chemically bond the molecules of said polyhydroxyl compound to each other, thereby producing a high molecular weight compound which has an average molecular weight of more than 20,000 and is soluble in solvents and moldable.

4,521,587

COMPOSITION FOR TREAD RUBBER OF TIRES

Hiroshi Furukawa, Kobe, and Yuichi Saito, Nishinomiya, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe and Sumitomo Chemical Company, Limited, Osaka, both of, Japan

Continuation of Ser. No. 496,913, May 23, 1983, abandoned, which is a continuation of Ser. No. 324,547, Nov. 24, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 576,799

Claims priority, application Japan, Dec. 2, 1980, 55-170647

Int. Cl.³ C08F *136/08*

U.S. Cl. 526—340.2 **2 Claims**

1. A tire having a tire tread portion, said tire tread portion being a rubber obtained by curing a rubber composition consisting essentially of (a) a minor amount of a tire tread rubber additive, and (b) a major amount of a synthetic isoprene rubber having a 3,4-bonding content of 25–50% by mol and an intrinsic viscosity of at least 2.0 in toluene at 30° C.

4,521,588

OPTICAL DEVICE INCLUDING BIREFRINGENT POLYHYDRAZIDE POLYMER

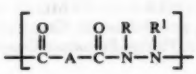
Howard G. Rogers, Weston; Ruth C. Bilofsky, Lexington, both of Mass.; Russell A. Gaudiana, Merrimack, N.H., and Ronald A. Sahatjian, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 238,054, Mar. 2, 1981, Pat. No. 4,446,305. This application Apr. 18, 1984, Ser. No. 601,610

Int. Cl.³ C08G *73/08*

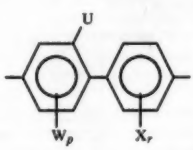
U.S. Cl. 528—363 **4 Claims**

1. An optical device including a transparent molecularly oriented highly birefringent polymer, said highly birefringent polymer comprising repeating molecular units exhibiting high electron density substantially cylindrically distributed about the long axes of the polymer and the repeating units thereof, said highly birefringent polymer being substantially optically uniaxial exhibiting only two indices of refraction, said molecularly oriented highly birefringent polymer comprising recurring units of the formula



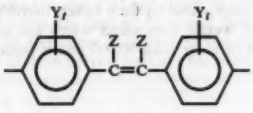
wherein R and R^1 are each hydrogen, alkyl, aryl, alkaryl or aralkyl, and A is a divalent radical selected from the group consisting of

(1) a radical



where U is a substituent other than hydrogen, each W is hydrogen or a substituent other than hydrogen, p is an integer from 1 to 3, each X is hydrogen or a substituent other than hydrogen and r is an integer from 1 to 4, said U, W_p and X_r substitution being sufficient to provide said radical with a non-coplanar molecular configuration; and

(2) a radical



where each of Y and Z is hydrogen or a substituent other than hydrogen and each t is an integer from 1 to 4, with the proviso that when each said Z is hydrogen, at least one said Y substituent is a substituent other than hydrogen positioned on the corresponding nucleus ortho with respect to the

moiety of said radical, said Z and Y_t substitution being sufficient to provide said radical with a non-coplanar molecular configuration.

4,521,589

LINEAR POLY(3-ALKYL-2,5-THIENYLENE) POLYMER

Takakazu Yamamoto, Yokohama; Akio Yamamoto, Tokyo, and Kenichi Sanechika, Yokohama, all of Japan, assignors to Tokyo Institute of Technology, Tokyo, Japan

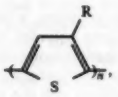
Continuation of Ser. No. 432,374, Sep. 30, 1982, abandoned. This application Jan. 4, 1984, Ser. No. 568,276

Claims priority, application Japan, Feb. 26, 1982, 57-29082

Int. Cl.³ C08G *75/00*; C08F *28/06*

U.S. Cl. 528—380 **18 Claims**

1. A linear poly(3-alkyl-2,5-thienylene) polymer consisting essentially of the repeating unit having the formula:



wherein R represents a lower alkyl group, and n is 20–100.

4,521,590

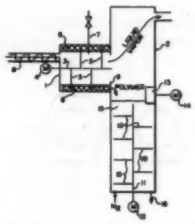
PARTICLE FORM EVAPORATION OF POLYMER-LIQUID MIXTURES

Richard E. Elliott, and William R. King, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 29, 1982, Ser. No. 427,220

Int. Cl.³ C08F *6/14*, *6.06*

U.S. Cl. 528—502 **18 Claims**



1. A process comprising introducing a mixture into a mechanically agitated bed of hot polymer particles; wherein said mixture comprises a liquid and a polymer not substantially dissolved in said liquid; and wherein said mixture is a latex produced in an emulsion polymerization process.

4,521,591

OIL-SOLUBLE DISAZO DYES AND THEIR USE IN COLOR-PHOTOGRAPHIC RECORDING MATERIALS FOR THE SILVER DYE BLEACH PROCESS

Gérald Jan, and John Lenoir, both of Fribourg, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

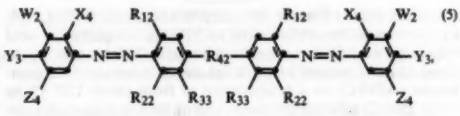
Filed Feb. 8, 1982, Ser. No. 346,785

Claims priority, application Switzerland, Feb. 20, 1981, 1145/81

Int. Cl.³ C09B *35/10*, *35/215*, *35/233*, *35/28*

U.S. Cl. 534—821 **4 Claims**

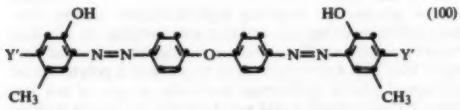
1. A compound of the formula



(5)

in which

X_4 is —NHCOM$_{12}$ or —NHP(O)(OG$_{12}$)$_2$, in which M$_{12}$ is alkyl having 1 to 16 carbon atoms, which is unsubstituted or substituted by carbalkoxy having 2 to 5 carbon atoms or by methoxy or ethoxy, and in which G$_{12}$ is alkyl having 1 to 4 carbon atoms, or X_4 is hydroxyl, Z_4 is hydrogen, alkyl or alkoxy having 1 to 8 carbon atoms or —CH$_2$CO$_2$R$_{53}$, in which R$_{53}$ is alkyl having 1 to 4 carbon atoms, —C$_2$H$_4$O)$_2$—CH$_3$ or —C$_2$H$_4$O—CH$_3$, or Z_4 is —(OC$_2$H$_4$)n$_2$—OU$_{12}$ or —NL$_{21}$COM$_{32}$, in which U$_{12}$ is hydrogen or alkyl having 1 to 4 carbon atoms, n$_2$ is 1 or 2, L 21 is hydrogen or alkyl having 1 to 4 carbon atoms and M$_{32}$ is alkyl having 1 to 8 carbon atoms, R$_{33}$ is hydrogen or methyl or, if R$_{42}$ is a direct chemical bond, the two radicals R$_{33}$ are hydrogen or methyl or form together a link member of the formula —CH$_2$— or —CO—, W_2 is hydrogen or methyl, Y_3 is N-alkylsubstituted or N,N-dialkylsubstituted amino, the alkyl moieties each containing 1 to 8 carbon atoms and being unsubstituted or substituted by methoxy, ethoxy, acetoxy, hydroxyl or cyano, or Y_3 is —NHCOM$_{22}$, in which M$_{22}$ is alkyl having 1 to 4 carbon atoms, methoxy or —O—(C$_2$H$_4$O)—n$_2$—CH$_3$, in which n$_2$ is 1 or 2, R$_{12}$ and R$_{22}$ independently of one another are hydrogen, chlorine, bromine, cyano, nitro or methylsulfone, R$_{42}$ is a direct chemical bond, or a link member of the formula —O—, —CO—, —SO$_2$—, —(CH$_2$)m$_2$—, in which m$_2$ is an integer from 1 to 6, or —CH=CH—, and at least one of the substituents W_2, Y_3 and Z_4 is other than hydrogen, and X_4 is different from hydroxyl, if Z_4 is hydrogen, and Z_4 is different from methyl, tert.-butyl and 1-hexyl, if R$_{42}$ is the direct chemical bond, —O—, —CH$_2$— or —CH=CH—, or the compounds of the formula



(100)

wherein Y' is —OC$_2$H$_4$CH(CH$_3$)$_2$, OC$_2$H$_4$OC$_4$H$_9$, —(OC$_2$H$_4$)$_2$OCH$_3$ or —OC$_8$H$_7$.

4,521,592
COMPOUNDS FOR THERAPEUTIC OR DIAGNOSTIC USE, A PROCESS AND INTERMEDIATES FOR THEIR PREPARATION

Jan E. Dahmén, Åkarp; Hans G. Magnusson, Staffanstorp, and Kaj B. Martensson, Lund, all of Sweden, assignors to Svenska Sockerfabriks AB, Malmö, Sweden

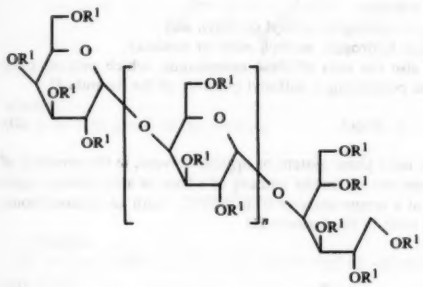
Filed Sep. 17, 1982, Ser. No. 419,314

Claims priority, application Sweden, Oct. 23, 1981, 8106279-6; Apr. 2, 1982, 8202144-5

Int. Cl.³ C07H *15/04*

U.S. Cl. 536—4.1 **9 Claims**

1. A compound having the formula (I):



(I)

wherein R^1 is hydrogen or acetyl; and n is an integer of up to 10 including zero.

4,521,593
PROCESS FOR OBTAINING LACTO-N-NORHEXAOSYL CERAMIDE

Michel Martin, Geneva, Switzerland, assignor to Laboratoire Lucchini S.A., Geneva, Switzerland

Filed Dec. 15, 1982, Ser. No. 450,183

Claims priority, application Switzerland, Dec. 17, 1981, 8056/81

Int. Cl.³ C07H *1/06*

U.S. Cl. 536—55.3 **3 Claims**

1. A process for obtaining lacto-N-norhexaosyl ceramide of formula:

$$Gal\beta1\rightarrow4GlcNAc\beta1\rightarrow3Gal\beta1\rightarrow4GlcNAc\beta1\rightarrow 3Gal\beta1\rightarrow4Glc\rightarrow Cer,$$

from raw gangliosides isolated from human placental tissue dissolved in an organic solvent wherein the gangliosides are precipitated therefrom by adding ethyl acetate, the impurities remaining in the organic solvent and separating the purified gangliosides, containing in approximately equal proportions sialyl esters of hematoside, paragloboside and lacto-N-norhexaosyl ceramide.

4,521,594
PROCESS FOR PRODUCING SODIUM CARBOXYMETHYLCELLULOSE

Tetuo Kanematu, Himeji, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 496,752, May 20, 1983, abandoned. This application Jun. 20, 1984, Ser. No. 622,391

Int. Cl.³ C08B *11/20*

U.S. Cl. 536—98 **7 Claims**

1. A method of treating a starting sodium carboxymethylcellulose to improve its dispersibility in water, said starting sodium carboxymethylcellulose having a ratio of equivalents of free carboxyl groups/sodium carboxylate of at least 0.01/100, and a 1% aqueous solution of said starting sodium carboxymethylcellulose having a pH in the range from 6.0 to 7.5 and a viscosity of at least 100 cPs, which comprises the steps of: heating said starting sodium carboxymethylcellulose at a temperature in the range of from 100° to 170° C., for a period of time effective to partially react the free carboxyl groups of said sodium carboxymethylcellulose with hydroxyl groups of said sodium carboxymethylcellulose to obtain a modified, cross-linked sodium carboxymethylcellulose which is water-soluble, does not form lumps when it is placed in water and exhibits improved dispersibility when it is placed in water, and wherein an aqueous solution of said modified sodium carboxymethylcellulose has a lower viscosity than an aqueous solution of said starting sodium carboxymethylcellulose.

4,521,595
PROCESS FOR THE PURIFICATION OF ESTERS

Herbert Stühler, and Engelbert Krempl, both of Burgkirchen, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 16, 1982, Ser. No. 399,195

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1981, 3128696

Int. Cl.³ C07H *1/06*

U.S. Cl. 536—127 **8 Claims**

1. A process for the purification of a liquid ester of essentially an aliphatic carboxylic acid and a monohydric or polyhydric alcohol from the residual amounts of said alcohol which may be either dispersed or dissolved in the liquid ester, said process comprising:

(a) adding to the liquid ester, while stirring, 0.01 to 20% by weight, relative to the weight of the ester to be purified, of a water-soluble etherified polysaccharide in a solid form and keeping the liquid ester in contact with the etherified polysaccharide for about 5 to about 120 minutes at about 15° to about 90° C. to take up said residual amounts of alcohol, and

(b) separating the purified and still liquid ester from etherified polysaccharide in solid form,

said water-soluble etherified polysaccharide being selected from the group consisting of the alkyl, hydroxyalkyl, and carboxylalkyl ethers of cellulose, starch, and guar, wherein the alkyl group has 1 to 3, the hydroxyalkyl group has 2 to 4, and the carboxyalkyl group has 2 to 3 carbon atoms.

5. A process as claimed in claim 1, wherein the ester to be purified is the reaction production of essentially a monocarboxylic fatty acid having 4 to 22 carbon atoms and of an alcohol selected from the group consisting of glycerol, diglycerol to decaglycerol, sorbitol and sorbitan as well as their oxethylates having 1 to 20 ethylene oxide units per molecule, and the oxethylates of glucose, lactose and sucrose having 1 to 20 ethylene oxide units per molecule.

4,521,596
FLUORORESIN-CONTAINING COATING COMPOSITION

Tatsushiro Yoshimura, and Shigetake Tominaga, both of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Sep. 24, 1982, Ser. No. 423,189

Claims priority, application Japan, Sep. 28, 1981, 56-154180

Int. Cl.³ C08K *3/10*

U.S. Cl. 524—406 **10 Claims**

1. An aqueous coating composition comprising a fluororesin, and (a) molybdic acid or its salt, (b) phosphoric acid or its salt, (c) ammonium hydroxide and (d) colloidal silica, the weight ratio of the fluororesin to the total amount of the ingredients (a), (b), (c) and (d) being 90:10 to 20:80 and the molar ratio of (a) molybdic acid or its salt as converted to MoO_3, (b) phosphoric acid or its salt as converted to orthophosphoric acid, (c) ammonium hydroxide and (d) colloidal silica being 1:1:1:1 to 1:20:15:20.

4,521,597

PROCESS FOR PRODUCING SULFONYLUREAS HAVING A HERBICIDAL ACTION

Haukur Kristinsson, Bottmingen, and Werner Töpfl, Dornach, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

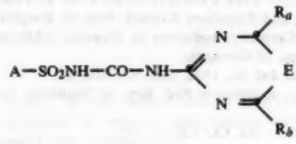
Filed Oct. 14, 1983, Ser. No. 542,312

Claims priority, application Switzerland, Oct. 25, 1982, 6202/82

Int. Cl.³ C07D *251/18, 251/46, 251/52, 239/69*

U.S. Cl. 544—3 **5 Claims**

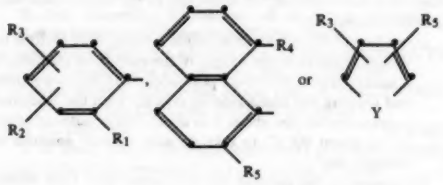
1. A process for producing sulfonylureas which have a herbicidal action and an action regulating plant growth, and which correspond to the formula I



(I)

wherein

A is a radical of the formula



Y is oxygen, sulfur or

R_1 is hydrogen, halogen, nitro, trifluoromethyl, C_1–C_5-alkyl, C_1–C_5-alkoxy, —COR_7, —$S(O)_m$—C_1–C_5-alkyl, —SO_2R_{10}, XR_{11} or —OSO_2C_1–C_5-alkyl,

R_2 is hydrogen, fluorine, chlorine, bromine, nitro, C_1–C_5-alkyl, C_1–C_5-alkoxy, trifluoromethyl, C_1–C_5-haloalkoxy or —COR_7,

R_3 is hydrogen, fluorine, chlorine, bromine, nitro, methoxy or trifluoromethyl,

R_4 is hydrogen, halogen, nitro, C_1–C_5-alkyl, methoxy, —COR_7 or —$SO_2NR_8R_9$,

R_5 is hydrogen, fluorine, chlorine, bromine, nitro, C_1–C_5-alkyl, C_1–C_5-alkoxy, trifluoromethyl, —$S(O)_mC_1$–C_5-alkyl, —COR_7 or —$SO_2NR_8R_9$,

R_6 is hydrogen, fluorine, methyl or methoxy,

R_7 is hydrogen, C_1–C_5-alkyl, C_1–C_5-haloalkyl, C_1–C_5-alkoxy, C_1–C_5-haloalkoxy, C_2–C_{10}-alkoxyalkoxy, C_3–C_5-alkenyloxy, C_3–C_5-alkynyloxy, phenoxy, benzyloxy, C_1–C_5-alkylthio or —NR_8R_9,

R_8 is hydrogen, C_1–C_5-alkyl, cyanoalkyl having a maximum of 5 carbon atoms, methoxy, ethoxy or C_3–C_5-alkenyl,

R_9 is hydrogen, C_1–C_5-alkyl or C_3–C_5-alkenyl, or

R_8 and R_9 together with the nitrogen atom binding them form a 5- or 6-membered, saturated heterocycle which can contain an oxygen or sulfur atom as ring member,

R_{10} is C_1–C_5-haloalkoxy or —NR_8R_9,

R_{11} is C_1–C_5-alkyl which is substituted by halogen, C_1–C_5-alkoxy, —$S(O)_mC_1$–C_5-alkyl, —$S(O)_mC_1$–C_5-haloalkyl or C_2–C_5-alkenyl which can be substituted by one of the above radicals,

X is oxygen or —$S(O)_m$—,

m is zero, one or two,

E is the methine group or nitrogen,

R_a is hydrogen, halogen, C_1–C_5-alkyl, C_1–C_5-haloalkyl, C_1–C_5-alkoxy, C_1–C_5-haloalkoxy, C_1–C_5-alkylthio, C_2–C_{10}-alkoxyalkyl or C_2–C_{10}-alkoxyalkoxy,

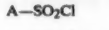
R_b is the same as R_a or is an amino group

wherein

R_c is hydrogen, methyl or ethyl, and

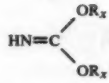
R_d is hydrogen, methyl, ethyl or methoxy,

and also the salts of these compounds, which process comprises condensing a sulfonyl chloride of the formula II



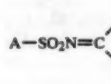
(II),

in an inert phase system or organic solvent, in the presence of at least the equimolar amount of a base as acid-binding agent and at a temperature of 0° to 100° C., with an imidocarbonic acid ester of the formula III



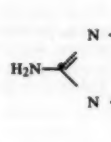
(III)

in which R_x is C_1–C_5-alkyl; isolating the formed sulfonylimidocarbonic acid diester of the formula IV



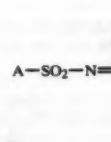
(IV)

reacting it then in an inert solvent in the presence of a strong base, at a temperature of between 0° and 100° C., with a 2-aminopyrimidine or 2-aminotriazine of the formula V



(V)

to give a sulfonylisourea of the formula VI



(VI)

and subsequently converting this in the presence of a hydrogen halide in an inert solvent, at a temperature of 0°–100° C., into a sulfonylurea of the formula I; and finally isolating this as such or as a salt.

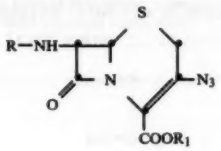
4,521,598

3-AZIDOCEPHALOSPORINS

Douglas O. Spry, Mooresville, and Wayne A. Spitzer, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

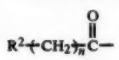
Filed Sep. 28, 1983, Ser. No. 536,468
Int. Cl.³ C07D 501/14; A61K 31/545
U.S. Cl. 544—16 12 Claims

1. The compound of the formula



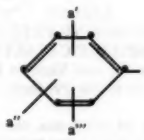
wherein
R is an acyl group of the formula

wherein
R^1 is C_1–C_4 alkyl, C_1–C_4 alkyl substituted by halogen or cyano;
or R is an aroyl or aralkanoyl group of the formula

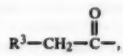


wherein
R^2 is phenyl or a mono substituted phenyl group of the formula

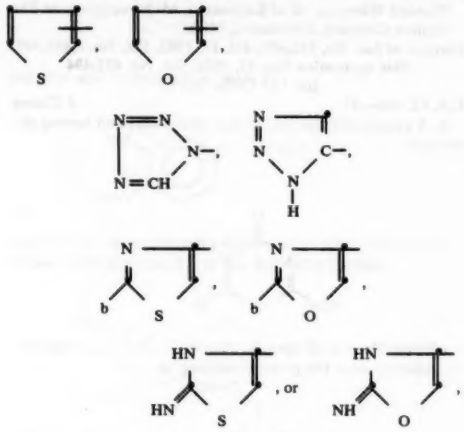
wherein
a is halogen, amino, hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, cyano, hydroxymethyl, aminomethyl, carboxamido, carboxymethyl, or C_1–C_4 alkoxycarbonylmethyl;
or R^2 is a di- or tri-substituted phenyl group of the formula



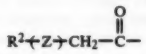
wherein
a', a'', and a''' are independently hydrogen, halogen, hydroxy, C_1–C_4 alkyl, or C_1–C_4 alkoxy; and
n is 0 or 1;
or R is a heteroarylalkanoyl group of the formula



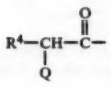
wherein
R^3 is



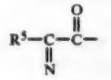
wherein
each b is amino, protected amino, C_1–C_3 alkyl or phenyl;
or R is an aryloxyacetyl or arylthioacetyl group of the formula



wherein
R^2 has the same meanings as defined above and Z is O or S;
or R is an α-substituted aralkanoyl or heteroarylalkanoyl substituted group of the formula



wherein
R^4 is R^2, as defined above, and in addition is thienyl, furyl, or 1,4-cyclohexadienyl; Q is hydroxy, formyloxy, carboxy, the sulfo group —SO_3H, or amino;
or R is an oximino-substituted aralkanoyl or heteroarylalkanoyl group of the formula



wherein
R^5 is R^2 and R^3 as each is defined above, and R^6 is hydrogen or C_1–C_3 alkyl;
R_1 is hydrogen or a carboxy protecting group;
and when R_1 is hydrogen the pharmaceutically acceptable non-toxic salts thereof.

4,521,599

PROCESS FOR THE PREPARATION OF 1,3-OXAZINE-4-ONES

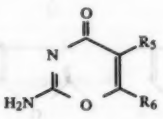
Harvey I. Skulnick; Herman W. Smith; Robert J. Smith, and Wendell Wierenga, all of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 512,497, Jul. 11, 1983, Pat. No. 4,495,349. This application Sep. 17, 1984, Ser. No. 651,494

Int. Cl.[3] **C07D** *265/02*

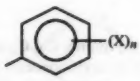
U.S. Cl. 544—97 **4 Claims**

1. A process for the preparation of a compound having the formula



III

wherein R_5 is hydrogen or bromine and R_6 is a member selected from the group consisting of



III$_6$

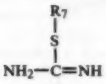
wherein n is a number of from 0 to 3, inclusive; and

X is hydroxy, alkyl of from 1 to 8 carbon atoms, inclusive; alkoxy of from 1 to 5 carbon atoms, inclusive; alkylthio of from 1 to 5 carbon atoms, inclusive; halogen; $-NX_1X_2$; aminoalkyl of from 1 to 3 carbon atoms, inclusive; nitro; benzyl; aryl; furyl; pyridyl, or thiophene, and wherein X_1 and X_2 are the same or different and are alkyl of from 1 to 8 carbon atoms, inclusive; or taken together with -N are a saturated cycloalkylamino group

wherein n' is 3, 4, 5 or 6 or dialkyl substituted cycloalkylamino, wherein each alkyl is from 1 to 3 carbon atoms, inclusive;

which comprises a process selected from

step (a) contacting an acid salt of alkylthiopseudourea of formula



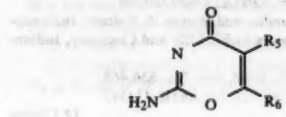
VI

wherein R_7 is alkyl of from 1 to 3 carbon atoms, inclusive; with a compound having the formula

V

wherein R_6 is as defined above, and R_2 is alkyl of from 1 to 8 carbon atoms, inclusive;

in the presence of a strong base to prepare the compound

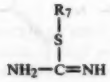


III

wherein R_5 is hydrogen, and R_6 is defined above;

or

step (a) contacting an acid salt of alkylthiopseudourea of formula



VI

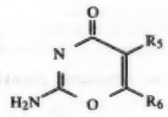
wherein R_7 is alkyl of from 1 to 3 carbon atoms, inclusive; with a compound having the formula

V

wherein R_6 is as defined above, and R_2 is alkyl of from 1 to 8 carbon atoms, inclusive;

in the presence of a strong base; and

step (b) contacting the product of step (a) with a brominating agent to prepare the compound



III

wherein R_5 is bromine, and R_6 is defined above.

4. A process according to claim 1 wherein the compound III prepared is

2-amino-6-phenyl-1,3-oxazine-4-one;

2-amino-5-bromo-6-phenyl-1,3oxazine-4-one; or

2-amino-6-m-fluorophenyl-1,3-oxazine-4-one.

4,521,600

TRIETHYLENEDIAMINE PREPARATION VIA PHOSPHATE CATALYSTS

James E. Wells, Ardmore, and Victoria Eskinazi, Boothwyn, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 24, 1982, Ser. No. 381,232

Int. Cl.[3] **C07D** *487/08*

U.S. Cl. 544—352 **8 Claims**

1. In methods for the synthesis of organic compounds by condensation reactions in the presence of phosphate catalysts, the improvement for producing triethylenediamine which comprises effecting condensation of an amine selected from the group consisting of hydroxyethyl piperazine, ethanolamine and N-aminoethylpiperazine in the presence of a catalyst comprising a mixture of a pyrophosphate, a monohydrogen phosphate or dihydrogen phosphate of strontium and a pyrophosphate, a monohydrogen phosphate or dihydrogen phosphate of barium.

4,521,601

PRACTICAL TOTAL SYNTHESIS UNNATURAL ENANTIOMERS OF OPIUM-DERIVED MORPHINANS

Kenner C. Rice, Rockville, Md., assignor to The United States of America as represented by the Department of Health & Human Services, Washington, D.C.

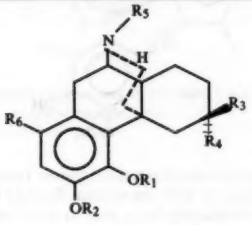
Continuation-in-part of Ser. No. 265,469, May 20, 1981, Pat. No. 4,410,700, which is a continuation-in-part of Ser. No. 165,690, Jul. 3, 1980, abandoned. This application Mar. 23, 1983, Ser. No. 477,970

The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.

Int. Cl.[3] C07D *489/02, 221/28, 217/20*

U.S. Cl. 546—45 1 Claim

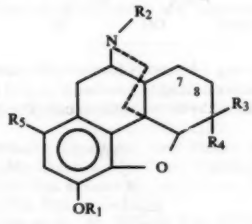
1. In the preparation of compounds 23 and 24



23

wherein

R_1 = H or lower alkoxy and
R_2 = H or lower alkoxy and
R_3 = H or OH or lower alkoxy and
R_4 = H or OH or lower alkoxy and
$R_3 + R_4$ = =O and
R_5 = H, methyl or lower alkyl or lower alkmonaryl and
R_6 = H, Br, or Cl



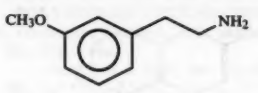
24

wherein

R_1 = H or lower alkoxy and
R_2 = H, methyl or lower alkyl or alkmonoaryl and
R_3 = H, OH or lower alkoxy and
R_4 = H, OH or lower alkoxy and
$R_3 + R_4$ = =O and
R_5 = H, Br or Cl and
An optional 7,8-double bond indicates coverage of the unnatural codeine series.

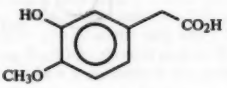
by a total synthesis method, the steps which comprise:

(a) heating a mixture of an amine compound of the formula 4



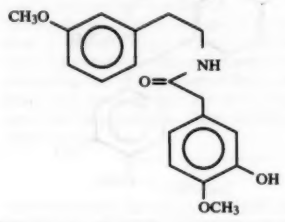
4

and pure acid compound, formula 5



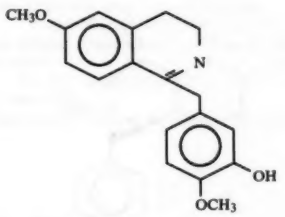
5

at 200° C. for about 2 hours under argon or other inert gas to obtain amide compound 6 of the following formula



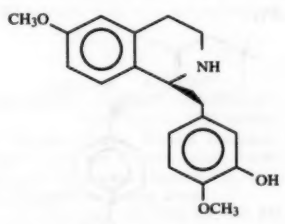
6

(b) contacting compound 6 with phosphorous oxychloride to produce the 1,2-dehydro derivative of compound 7 shown below:

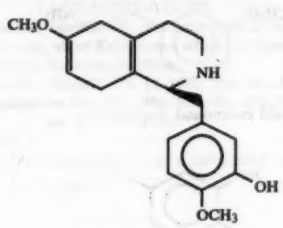


which need not be isolated;

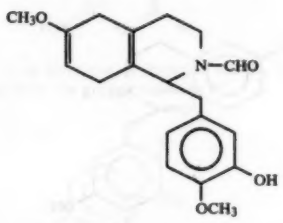
(c) neutralizing the 1,2-dehydro derivative of compound 7 with aqueous ammonia and reducing with sodium cyanoborohydride or sodium borohydride to give racemic 7 which is then resolved by optically active acids to the compound tetrahydroisoquinoline (+)-7 to (−)-7



(d) treating of (−)-7 with lithium or sodium in liquid ammonia as a reducing agent to give hexahydroisoquinoline, compound (−)-8



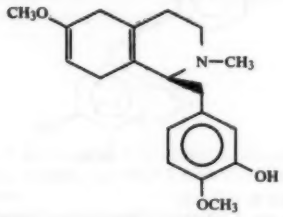
and formylating compound (−)-8 to give 10



10

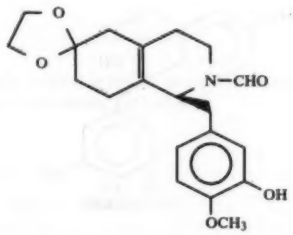
and introducing a protective group for the nitrogen in the subsequent steps of the reaction where the reagent for formylation of 8 to 10 is phenylformate chloral or ethyl formate

(e) alternately, N-methylating compound (−)-7 or (−)-8 by treatment with methyl halides or sulfonate to give the N-methyl derivative of 7 or compound 9



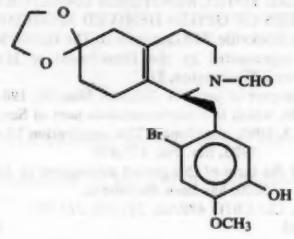
9

(f) contacting compound 10 with ethylene glycol in dry methane sulfonic acid in dry tetrahydrofuran to afford the ketal product, 11



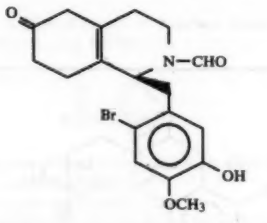
11

(g) brominating of ketal 11 with N-bromoacetamide (NBA) to give bromo ketal 12



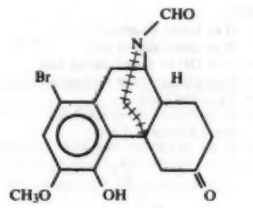
12

(h) deketalizing bromo ketal 12 with aqueous formic acid to yield beta, gamma unsaturated ketone 13



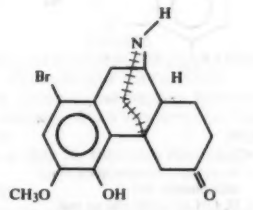
13

(i) treating beta, gamma unsaturated bromo ketone 13 with a super acid alone or with ammonium fluoride HF complex with trifluoromethanesulfonic acid to give 1-bromo-N-formylnordihydrothebainone (+)-17



17

(j) acid hydrolyzing 1-bromo-N-formylnordihydrothebainone (+)-17 with aqueous acid and methanol to give the intermediate 1-bromonordihydrothebainone, compound (+)-18

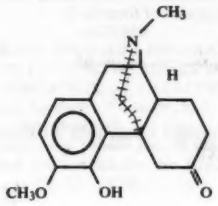


18

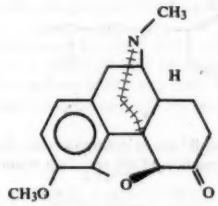
(k) converting intermediate (+)-18, 1-bromonordihydrothebainone, to dihydrothebainone (+)-19, a codeine precursor by hydrogenation in the presence of formaldehyde with palladium on carbon catalyst in 2-normal (2N) acetic acid containing sodium acetate; or

(l) treating intermediate (+)-18 with bromine in acetic acid or chloroform followed by treating with sodium hydroxide to close the oxide bridge and afford as an intermediate (+)-1-bromonordihydrocodeinone which need not be isolated but

is hydrogenated in the presence of formaldehyde to give dihydrocodeinone (+)-22, a codeine precursor or

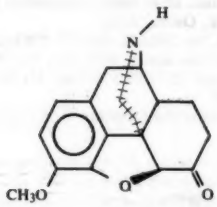


19



22

(m) alternately, converting compound (+)-18 into compound (+)-21, nordihydrocodeinone



by bromination in acetic acid followed by treating with an aqueous base to close the oxide bridge, and hydrogenating the unisolated intermediate with palladium on carbon catalyst in 2-norman (2N) acetic acid containing sodium acetate.

4,521,602

PREPARATION OF PYRIDINES OR PYRROLES FROM α,ω-DINITRILES

Walter Rebafka, Eppelheim; Gerd Heilen, Speyer; Klaus Halbritter, Mannheim, and Wolfgang Franzischka, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 347,162, Feb. 9, 1982, abandoned. This application Jun. 9, 1983, Ser. No. 502,522

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1981, 3104765

Int. Cl.³ C07D *211/10, 213/08, 207/32*

U.S. Cl. 546—184 **5 Claims**

1. A process for the preparation of pyridine or pyrrole or their lower alkyl-substituted products which comprises: reacting unsubstituted glutarodinitrile, lower alkyl-substituted glutarodinitrile, unsubstituted succinodinitrile or lower alkyl-substituted succinodinitrile or mixtures thereof with a 2- to 100-fold excess of gaseous hydrogen, said reaction being conducted in the gas phase, at essentially atmospheric pressure, in the presence of a conventionally supported or unsupported platinum-metal hydrogenation catalyst, and at a temperature above 150° C. but below the decomposition temperatures of the dinitrile reactant and the resulting reaction product.

4,521,603

CONTINUOUS PROCESS FOR THE PRODUCTION OF POLYBROMOPYRIDINE COMPOUNDS

Max M. Boudakian, Pittsford, N.Y., assignor to Olin Corporation, Cheshire, Conn.

Filed Feb. 1, 1983, Ser. No. 462,845

Int. Cl.³ C07D *213/61, 213/72, 213/80, 211/84*

U.S. Cl. 546—304 **9 Claims**

1. A continuous process for producing a polybromopyridine compound which comprises:

a. admixing a polychloropyridine compound with an anhydrous water soluble solvent selected from the group consisting of glacial acetic acid and lower aliphatic alcohols having from 1 to about 4 carbon atoms in a first reaction zone to form a solution of the polychloropyridine compound;

b. introducing hydrogen bromide gas into the solution of polychloropyridine compound while maintaining the solution at a temperature in the range of from about 70° to about 140° C. to produce a solution of the corresponding polybromopyridine compound;

c. cooling the solution to a temperature in the range of from about 5° to about 35° C. to precipitate the polybromopyridine compound from the anhydrous water soluble solvent;

d. separating the polybromopyridine compound from the anhydrous water soluble solvent in a separation zone; and

e. returning the anhydrous water soluble solvent to the first reaction zone.

4,521,604

HETEROCYCLIC DIHALOACETAMIDES, AND HERBICIDES WHICH CONTAIN ACETANILIDES AS HERBICIDAL ACTIVE INGREDIENTS AND THE DIHALOACETAMIDES AS ANTAGONISTIC AGENTS

Peter Plath, Ludwigshafen; Wolfgang Rohr, Wachenheim; Volker Schwendemann, Wiesenbach, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

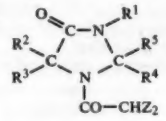
Filed May 10, 1982, Ser. No. 376,744

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119077

Int. Cl.³ A01N *9/02;* **C07D** *233/32, 241/08*

U.S. Cl. 548—301 **2 Claims**

1. Heterocyclic dihaloacetamides of the formula



(I)

where R^1 is hydrogen or alkyl of 1 to 4 carbon atoms, R^2 is hydrogen or methyl, R^3 is hydrogen or alkyl of 1 to 3 carbon atoms, R^4 is hydrogen, alkyl of 1 to 4 carbon atoms or cyclohexyl, R^5 is hydrogen or methyl, Z is chlorine or bromine and n is 0, or where R^2 together with R^3 is pentamethylene, or where R^4 together with R^5 is tetramethylene or pentamethylene.

4,521,605

CARBAZOLE COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Hideo Okazaki, Tokyo; Hiroshi Imagome, Urawa; Susumu Suzuka, Yono, and Kiyoshi Sakai, Numazu, all of Japan, assignors to Hodogaya Chemical Co., Ltd. and Ricoh Company, Ltd., both of Tokyo, Japan

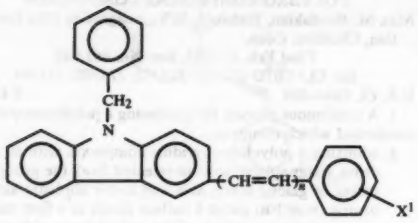
Filed Sep. 24, 1982, Ser. No. 423,420

Claims priority, application Japan, Oct. 3, 1981, 56-157879

Int. Cl.³ C07D *209/86*

U.S. Cl. 548—440 **10 Claims**

1. A carbazole compound having the formula



wherein X^1 represents hydrogen, a C_{1-4} alkyl group, a C_{1-4} alkoxy group, a halogen atom, a nitro group, an amino group, a C_{1-4} alkylamino group or a benzylamino group; and n is an integer 1 or 2.

4,521,606

5-INDOLYL SUBSTITUTED AMINOETHANOLS

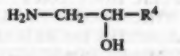
Andre A. Asselin, St. Laurent; Danilo A. Crosilla, Ile Bizard, and Leslie G. Humber, Dollard-des-Ormeaux, all of Canada, assignors to American Home Products Corp., New York, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,888

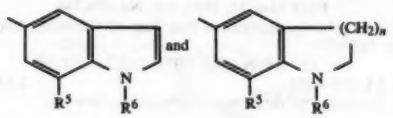
Int. Cl.³ C07G *209/08*

U.S. Cl. 548—503 **3 Claims**

1. A compound of the formula

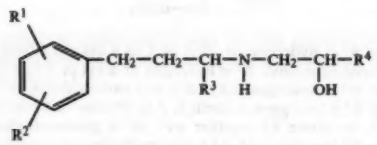


in which R^4 is a heterocycle selected from the group consisting of

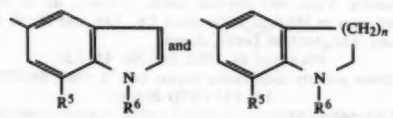


wherein n is the integer 1 or 2; R^5 is cyano, aminocarbonyl, methylthio, methylsulfinyl, methylsulfonyl or aminosulfonyl; and R^6 is hydrogen or lower alkyl.

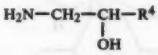
3. A process for preparing a compound of the formula



in which R^1 and R^2 each is hydrogen, halogen or lower alkoxy, or adjacent R^1 and R^2 are joined together to form a methylenedioxy chain; R^3 is lower alkyl containing one to three carbon atoms; and R^4 is a heterocycle selected from the group consisting of

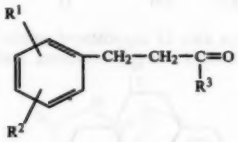


wherein n is the integer 1 or 2; R^5 is cyano, aminocarbonyl, methylthio, methylsulfinyl, methylsulfonyl or aminosulfonyl; and R^6 is hydrogen or lower alkyl; or a therapeutically acceptable acid addition salt thereof which comprises condensing a corresponding compound of formula X



(X)

in which R^4 is as defined herein with a corresponding compound of formula XI



(XI)

in which R^1, R^2 and R^3 are as defined herein, followed by the subsequent hydrogenation of the resulting enamine intermediate.

4,521,607

CHROMANYL GLYCINES

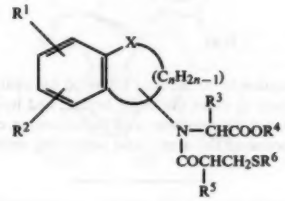
Yoshikazu Oka, Kawanishi; Kohei Nishikawa, Kyoto, and Akio Miyake, Hirakata, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 238,821, Feb. 27, 1981, abandoned. This application Apr. 2, 1982, Ser. No. 365,038

Int. Cl.³ C07D *307/82, 311/68*

U.S. Cl. 549—39 **15 Claims**

1. A compound of the formula



wherein

R^1 and R^2 independently represent hydrogen, halogen, C_{1-4}alkyl, hydroxyl, C_{1-4}alkyloxy or C_{7-9}arlkyloxy, or R^1 and R^2 jointly represent C_{1-4}alkylenedioxy;

R^3 and R^4 independently represent hydrogen or C_{1-4}alkyl;

R^5 is hydrogen, C_{1-4}alkyl or $—CH_2SR^7$ wherein R^7 is hydrogen, C_{2-4}alkanoyl or benzoyl;

R^6 is hydrogen, C_{2-4}alkanoyl or benzoyl, or R^6 and R^7 join to form a single bond;

X is —O— and

n is 2, 3 or 4,

or a pharmaceutically acceptable salt thereof.

4,521,608

SEPARATION OF 1,8-CINEOLE BY FORMING A COMPLEX WITH HYDROQUINONE

Peter W. D. Mitchell, Freehold, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed May 12, 1983, Ser. No. 494,108

Int. Cl.³ C07D *311/02*

U.S. Cl. 549—397 **7 Claims**

1. A method of separating 1,8-cineole from mixtures of said 1,8-cineole with 1,4-cineole and terpene hydrocarbons, which comprises; reacting the 1,8-cineole with solid anhydrous hy-

droquinone to form a crystalline complex which is insoluble in said mixture; separating the insoluble complex; and dissociating the separated complex to recover the 1,8-cineole.

4,521,609

CYCLOALKANE EPOXIDES PRODUCED BY AIR OXIDATION OF CYCLOALKENES OVER LEAD ZIRCONATE AS CATALYST

John R. Sanderson; Lewis W. Watts, Jr., both of Austin; Steven H. Vanderpool, New Braunfels, and Terry L. Renken, Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 1, 1983, Ser. No. 510,143
Int. Cl.³ C07D *301/06*
U.S. Cl. 549—533 **2 Claims**

1. A method for the production of cycloalkane epoxides comprising

reacting a cycloalkane having 5 to 16 carbon atoms with oxygen in the presence of lead zirconate as catalyst at a concentration of from 0.0001 to 1 wt% where acetic acid is also present at a temperature in the range of about 50° to 150° C.

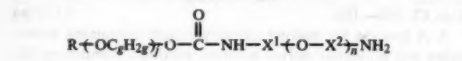
4,521,610

POLY(OXYALKYLENE) AMINOETHER CARBAMATES AS DEPOSIT CONTROL ADDITIVES

Frank Plavac, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 30, 1982, Ser. No. 429,695
Int. Cl.³ C07C *125/065*
U.S. Cl. 560—27 **8 Claims**

1. A compound of the formula



wherein n is an integer from 1 to 10; g is an integer from 2 to 5; j is an integer such that the molecular weight of the compound is in the range of about 500 to 10,000; R is a hydrocarbyl group of from about 1 to 30 carbon atoms; and X^1 and X^2 are the same or different substituents selected from the group consisting of (A) alkylene groups containing 1 to 6 carbon atoms; (B) arylene groups of from 6 to 12 carbon atoms; and (C) groups selected from (A) and (B) and substituted with groups selected from hydroxyl, alkoxyl, nitrile, amino, and alkyl and/or aryl groups substituted with substituents selected from hydroxyl, alkoxyl, nitrile, amino groups; and wherein X^2 can vary independently within the groups consisting of (A), (B) and (C) up to n times.

4,521,611

POLYESTER POLYOL BLEND FROM PHTHALIC ANHYDRIDE BOTTOMS

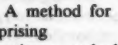
George Magnus, Arlington Heights, Ill., assignor to Stepan Chemical Company, Northfield, Ill.

Continuation-in-part of Ser. No. 381,298, May 24, 1982, abandoned. This application Jun. 27, 1983, Ser. No. 507,532
Int. Cl.³ C07C *69/80, 69/76*
U.S. Cl. 560—91 **3 Claims**

1. An ester polyol composition characterized by:

(A) containing on a 100 weight percent total composition basis—

(1) from about 2 to 35 weight percent of at least one polyol of the formula:

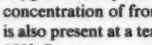


wherein

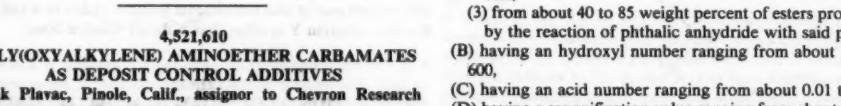
R′ is a divalent radical selected from the group consisting of:

(a) alkylene radicals each containing from 2 through 6 carbon atoms

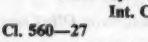
(b) radicals of the formula:



R^2 is a radical selected from the group consisting of:



(c) radicals of the formula:



R^3 is an alkylene radical containing from 2 through 3 carbon atoms, and

n is an integer of from 1 through 3,

(2) from about 7.0 to 45 weight percent of acetone insolubles,

(3) from about 40 to 85 weight percent of esters produced by the reaction of phthalic anhydride with said polyol,

(B) having an hydroxyl number ranging from about 190 to 600,

(C) having an acid number ranging from about 0.01 to 7,

(D) having a saponification value ranging from about 295 to 425,

(E) having a viscosity ranging from about 10,000 to 150,000 centipoises at 25° C. measured with a Brookfield viscometer with a #6 spindle operating at about 10 rpm,

said ester polyol composition having been produced by the process of contacting a phthalic anhydride bottoms composition with at least one said polyol,

(A′) said phthalic anhydride bottoms composition being characterized by containing on a 100 weight percent total basis:

(1) from about 50 to 95 weight percent of phthalic acid anhydride,

(2) from about 1 to 20 weight percent of at least one compound selected from the group consisting of trimellitic acid and trimellitic acid anhydride, and

(3) from about 3 to 40 weight percent of unknown acetone insolubles, and by having

(4) an acid number ranging from about 380 to 750, and

(5) an hydroxyl number of substantially zero,

(B′) the initial mole ratio of said polyol to said phthalic anhydride bottoms composition ranging from about 2 to 4 based on an estimate of the total carboxylic acid and carboxylic acid anhydride content of said phthalic anhydride bottoms composition,

(C′) said contacting being done while maintaining:

(1) liquid phase reaction conditions,

(2) a temperature ranging from about 190° to 250° C., and

(D′) said contacting being continued until:

(1) the hydroxyl number of the resulting mixture reaches a value ranging from about 190 to 600, and

(2) the acid number of the resulting mixture reaches a value ranging from about 0.01 to 7.

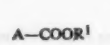
4,521,612

PROCESS FOR THE SEPARATION OF ESTERS

Rudolf Soós; Rezso Kolta; Sándor Zoltán, and Mária Tary, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Oct. 10, 1984, Ser. No. 659,320
Claims priority, application Hungary, Oct. 10, 1983, 3496/83
Int. Cl.³ C07C *69/743*
U.S. Cl. 560—124 **5 Claims**

1. Process for the selective separation of an ester of the formula II



II

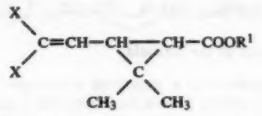
wherein

A stands for $-CH=CH-COOR^1$, $-CH_2OCH_2COOR^1$, $-CH_2OCH[CH(CH_3)_2]-CH=CX_2$ or $-CH_2OCH[CH(CH_3)(CH_2X)]-CH=CX_2$

X is halogen,

R^1 represents an alkyl group of 1 to 5 carbon atoms,

from mixtures containing the cyclopropane carboxylic acid esters of the formula I



I

in addition to the said esters of the formula II which comprises reacting the said mixture with an amine of the formula III

III

wherein

R^2 stands for hydrogen, amino, oxyalkyl of 2 to 5 carbon atoms, or aminoalkyl of 2 to 5 carbon atoms or alkyl of 1 to 6 carbon atoms,

R^3 represents hydrogen oxyalkyl of 2 to 5 carbon atoms or aminoalkyl of 1 to 5 carbon atoms or

R^2 and R^3 together represent a $-CH_2CH_2OCH_2CH_2-$ group, then removing the acid amides formed from the esters of the formula II by washing the mixture with water or removing the esters of the formula I by distillation.

4,521,613

4(HYDROCARBYLTHIO)ACETOACETIC ESTERS

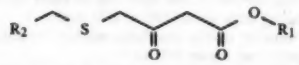
Alan O. Pittet, Atlantic Highlands; Thomas F. Courtney, Jr., Oakhurst, and Ranya Muralidhara, Fair Haven, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 14, 1984, Ser. No. 589,575

Int. Cl.³ C07C *149/20*; A23L *1/226*

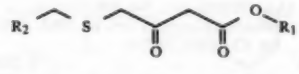
U.S. Cl. 560—152 **6 Claims**

1. The 4(hydrocarbylthio)acetoacetic ester having the structure:



wherein R_1 represents cis-3-hexenyl and R_2 is selected from the group consisting of hydrogen and ethyl.

4. The 4(hydrocarbylthio)acetoacetic ester having the structure:



wherein R_1 is selected from the group consisting of ethyl and isobutyl and R_2 is vinyl.

4,521,614

CARBONYLATION OF MONOOLEFINS

Jean Jenck, Villeurbanne, France, assignor to Rhone-Poulenc Chimie De Base, Courbevoie, France

Filed May 3, 1983, Ser. No. 491,040

Claims priority, application France, May 7, 1982, 82 08120

Int. Cl.³ C07C *67/38*

U.S. Cl. 560—193 **21 Claims**

1. A process for the preparation of a linear ester, which comprises reacting an alcohol and carbon monoxide with a monoolefin in the presence of a catalytically effective amount of cobalt and a tertiary nitrogen base, said reaction being carried out in an aromatic hydrocarbon reaction medium bearing from 1 to 3 nuclear substituents, and said substituents comprising cyano or a radical of the formula R—Y— having up to 20 carbon atoms, wherein Y is a direct valence bond, an oxygen atom, a sulfur atom, a carbonyl group or a carbonyloxy group (—CO—O—), with R being bonded to the oxygen of the group —CO—O—, and R is alkyl, aralkyl or aryl, or a cyano substituted such R—Y— radical, or a radical R—Y— which includes one of the divalent bridges —O—, —CO— or —CO—O— along its skeletal carbon chain, with the proviso that at least one of said substituents is either cyano or a radical R—Y— wherein Y is other than a direct valence bond.

4,521,615

PREPARATION OF CARBOXYLIC ACID-CONTAINING MONOETHER AND POLYETHER POLYOL ADDITION PRODUCTS

Richard L. Frentzel, Guilford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Mar. 16, 1983, Ser. No. 475,785

Int. Cl.³ C07C *67/08, 69/60*

U.S. Cl. 560—198 **6 Claims**

1. A process for making carboxylic acid-containing monoether and polyether polyol addition products comprising the step of:

(a) reacting at least one polyhydroxy-containing monoether or polyether compound with an ethylenically unsaturated dicarboxylic acid selected from the group consisting of maleic acid, fumaric acid, and mixtures thereof in the presence of a peroxy-type free-radical initiator, said weight ratio of said polyhydroxy-containing monoether or polyether compound to said acid being from about 99:1 to about 70:30.

4,521,616

METHOD FOR THE PREPARATION OF FLUOROANTHRANILIC ACIDS

Michael J. Fifolt, Grand Island, N.Y., and Arthur M. Foster, Birmingham, Mich., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,574

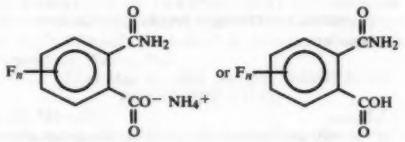
The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.³ C07C *101/42*

U.S. Cl. 562—456 **23 Claims**

1. A process for the preparation of fluoroanthranilic acids comprises

reacting ammonium fluorophthalamate or a fluorophthalamic acid of the formula



where n is 1 or 2 with an alkali metal or alkali earth metal hypochlorite to form a fluoroanthranilic acid.

4,521,617
PROCESS FOR PREPARING PURE ALKYL 1-HYDROXY-2-NAPHTHOATES

Theodor Papenfuhs, Frankfurt am Main, and Heinrich Volk, Bad Vilbel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

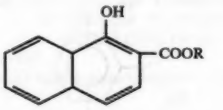
Filed Mar. 1, 1984, Ser. No. 585,189

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307637

Int. Cl.³ C07C *51/43*

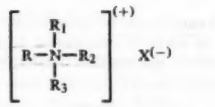
U.S. Cl. 562—467 **1 Claim**

1. A process for preparing pure alkyl 1-hydroxy-2-naphthoates of the formula (I)



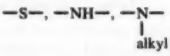
(I)

in which R denotes straight-chain or branched alkyl of 1 to 5 carbon atoms, which comprises adjusting, with mineral acid, to pH 5.5–6.5 an aqueous solution of monoalkali and/or dialkali metal salts of 1-hydroxy-2-naphthoic acid obtained by carboxylating an alkali metal 1-naphtholate by the Kolbe-Schmitt method, followed by treatment with water, or by dissolving, in aqueous alkali metal hydroxide solution, 1-hydroxy-2-naphthoic acid prepared in this way but isolated, then adding a surface-active cationic compound (1) of the general formula (II)

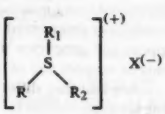


(II)

in which R, R_1, R_2 and R_3 each denote identical or different, straight-chain or branched aliphatic radicals of 1 to 30 carbon atoms which are saturated or contain 1, 2 or 3 carbon-carbon double bonds and which can contain 1 to 3 hetero atoms or groupings from the series consisting of —O—,

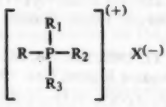


and quaternized nitrogen atoms, and/or carboxamide groups, and which, furthermore, can contain in terminal positions, ionic substituents, or hydroaromatic carbocyclic or cycloaliphatic radicals which each have 4 to 8 ring carbon atoms and can bear aliphatic side chains of 1 to 12 carbon atoms or halogen atoms, or aralkyl radicals where the alkyl radical contains 1 to 30 carbon atoms and the aryl radical is a phenyl or naphthyl radical which can be substituted in the aromatic nucleus by hydroxyl groups, lower alkyl groups, lower alkoxy groups and/or halogen atoms, or aryl radicals which can be substituted on the aromatic nucleus by hydroxyl, lower alkoxy, lower alkyl, carboxamide or sulfonamide groups or halogen atoms, the total number of the carbon atoms of R, R_1, R_2 and R_3 being at least 8 and two or three of the aliphatic radicals R, R_1, R_2 and R_3 on the quaternary nitrogen atom being capable of forming together with the nitrogen atom a heterocyclic ring which may contain double bonds and onto which a benzene nucleus can be fused and in which $X^{(-)}$ represents one equivalent of an inorganic or organic acid, or (2) of the general formula (III)



(III)

in which R, R_1, R_2 and $X^{(-)}$ have the meanings mentioned in the definition of formula (II), but where the total number of carbon atoms of R, R_1 and R_2 is at least 6 and two of the aliphatic radicals R, R_1 and R_2 together with the sulfur atom can form a heterocyclic ring which may contain double bonds, or (3) of the general formula (IV)



(IV)

in which R, R_1, R_2, R_3 and $X^{(-)}$ have the meanings given in the definition of formula (II), where the total number of carbon atoms of R, R_1, R_2 and R_3 is at least 8 and two or three of the aliphatic radicals R, R_1, R_2 and R_3 can form together with the phosphorus atom a heterocyclic ring which may contain double bonds, in each case in an amount of 0.5 to 5% by weight relative to the amount of 1-hydroxy-2-naphthoic acid present in the solution, separating or filtering off the solid or liquid precipitates quantitatively formed from the resins present at temperatures of 50° C. to 100° C. if desired after addition of adsorbents and/or filtering aids and esterifying with dialkyl sulfate the pure monoalkali metal salt of 1-hydroxy-2-naphthoic acid present in aqueous solution at pH 5.5–6.5 and temperatures between 30° and 80° C.

4,521,618
PROCESS FOR PREPARING ACRYLIC OR METHACRYLIC ACID

Dietrich Arntz; Günter Prescher, both of Hanau; Werner Burkhardt, Brachttal; Johannes Heilos, Seligenstadt, and Reinhard Manner, Maintal, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 390,446, Jun. 21, 1982,. This application Oct. 18, 1983, Ser. No. 542,964

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125062

Int. Cl.³ C07C *51/32*

U.S. Cl. 562—535 **1 Claim**

1. In a process for preparing acrylic acid or methacrylic acid by oxidizing acrolein or methacrolein, the improvement which comprises using as the catalyst an abrasion-resistant coated catalyst formed of an inert support which has a rough surface and a particle size of 0.5 to 6 mm and a coating of active catalyst material enclosing this support and anchored in it,

said catalyst having been made by a process comprising agitating a bed of the support and spraying thereon a suspension of the starting material for the coating while partially removing the suspending medium by a gas stream at a temperature of 20–250° C., essentially constant residual moisture of the coating being maintained, drying and heat-treating for 0.05 to 5 hours at 320°–450° C., wherein a mixing motion is imparted to the support bed by mechanical action and the support bed is simultaneously loosened by blowing in from below a fluidizing, mixing-intensifying gas stream; providing a suspension of a precursor of the catalytically active material which is an oxidic powder of the composition $Sb_{1\text{-}60}Mo_{12}V_{0.5\text{-}25}W_{0.1\text{-}12}M_{0\text{-}12}O_x$ in which M denotes at least one of the elements lead, silver, copper, tin, titanium or bismuth, which suspension contains a binder, is passed countercurrent to the gas in this bed at a rate which increases with increasing

thickness of the coating, the amounts of suspending medium drawn off and sprayed being maintained in a substantially constant ratio which is determined by the particular combination of support and precursor used, the thermal expansion coefficients of support and of dried pulverulent precursor being so chosen that they differ by at most 15%, and wherein after the spraying-on has been completed the coating is densified by continuing the increased mixing motion, the mechanical mixing motion is then stopped, the material is dried in a continuing gas stream and finally heat-treated.

4,521,619

THERAPEUTICALLY USEFUL SULPHUR-CONTAINING BENZYLIDENE DERIVATIVES

Jean-Pierre Kaplan, Bourg la Reine, France, assignor to Synthelabo, Paris, France

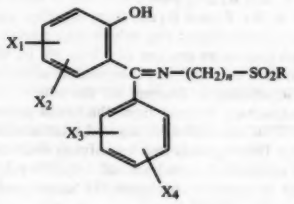
Filed Nov. 17, 1983, Ser. No. 552,901

Claims priority, application France, Nov. 29, 1982, 82 19982

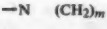
Int. Cl.³ C07C *143/80, 143/64;* A61K *31/40;* C07D *211/54*

U.S. Cl. 514—315 **7 Claims**

1. A benzylidene derivative of the formula:



wherein n represents an integer from 1 through 4, R represents an amino radical, a monoalkylamino group containing 1 through 4 carbon atoms in the alkyl radical, a dialkylamino group containing 1 through 4 carbon atoms in each alkyl radical, or when n represents 2, 3 or 4 a group



in which m represents 4 or 5, or a group —OM in which M represents an alkali metal or alkaline earth metal, and X_1, X_2, X_3 and X_4 each represent, independently of one another, a hydrogen atom, a halogen atom, or an alkyl radical of 1 through 6 carbon atoms.

4,521,620

ACRYLAMIDE SYNTHESIS FROM AN OIL-IN-WATER EMULSION CONTAINING ACRYLONITRILE

Kenneth G. Phillips, River Forest, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 213,279, Dec. 5, 1980, abandoned, which is a continuation of Ser. No. 97,287, Nov. 26, 1979, abandoned. This application Dec. 9, 1981, Ser. No. 329,010

Int. Cl.³ C07C *102/08*

U.S. Cl. 564—128 **6 Claims**

1. A method of producing acrylamide from acrylonitrile in the presence of a metallic conversion catalyst which comprises contacting an oil-in-water emulsion of acrylonitrile, said water phase being the continuous phase and containing up to 7% acrylonitrile and said oil phase being the dispersed phase and containing the remaining acrylonitrile to be converted to acrylamide, with a metallic conversion catalyst, whereby a substantial portion of the acrylonitrile is converted to acrylamide which remains in the aqueous phase of the oil-in-water emulsion, and then an additional low HLB emulsifier is added to invert the oil-in-water emulsion to a water-in-oil emulsion containing acrylamide.

4,521,621

NOVEL SQUARAINE SYSTEMS

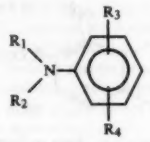
John F. Yanus, Webster, and William W. Limburg, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1983, Ser. No. 557,795

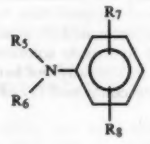
Int. Cl.³ C07C *85/00, 85/02, 85/06*

U.S. Cl. 564—307 **7 Claims**

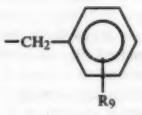
1. A process for synthesizing an unsymmetrical squaraine composition comprising forming a mixture comprising squaric acid, a primary alcohol having a boiling point between about 150° C. and about 190° C., a first tertiary amine having the formula:



and a second tertiary amine having the formula:



wherein R_1, R_2, R_5 and R_6 are independently selected from the group consisting of alkyl radicals having from 1 to 4 carbon atoms, phenyl radicals, and radicals having the formula:



and R_3, R_4, R_7 and R_8 are independently selected from the group consisting of H, CH_3, CH_2CH_3, CF_3, F, Cl, Br, and COOH wherein at least one of R_3 and R_4 are different than R_7 and R_8 if R_7 and R_8 are located on the same relative position on the aromatic ring as R_3 and R_4 and wherein R_9 is selected from the group consisting of H, alkyl radicals having from 1 to 4 carbon atoms, F, Cl, Br, COOH, CN and CF_3, and heating said mixture in vacuo below the boiling points of said primary alcohols, said first tertiary amine and said second tertiary amine to form said unsymmetrical squaraine composition.

4,521,622

PROCESS FOR PRODUCING AROMATIC AMINE

Naoki Andoh, and Shuetsu Fujiwara, both of Yokohama, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1984, Ser. No. 576,956

Claims priority, application Japan, Feb. 15, 1983, 58-22052; Aug. 24, 1983, 58-154418; Oct. 31, 1983, 58-202771

Int. Cl.³ C07C *85/04*

U.S. Cl. 564—406 **14 Claims**

1. A process for producing an aromatic amine from an aromatic halide and ammonia, characterized by comprising the following steps (1), (2) and (3):

step (1): reacting the aromatic halide with ammonia in the

presence of water using a catalyst comprising a copper compound as the main constituent,

step (2): extracting the aromatic amine from the reaction mixture obtained in step (1) without depositing and separating the copper component contained in the reaction mixture, and

step (b 3): depositing copper compounds by addition of an alkali metal hydroxide and/or an alkaline earth metal hydroxide to the raffinate aqueous solution which is obtained in step (2), and separating the same.

4,521,623

2,2-BIS[(2-HALO-4-AMINOPHENOXY)PHENYL]-HEXAFLUOROPROPANE

Robert J. Jones, Hermosa Beach, and Glenn E. C. Chang, Redondo Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 483,024, Apr. 7, 1983,. This application Feb. 17, 1984, Ser. No. 581,391

Int. Cl.³ C07C *87/48*

U.S. Cl. 564—430 **2 Claims**

1. 2,2-bis[(2-halo-4-aminophenoxy)phenyl]hexafluoropropane.

4,521,624

PROCESS FOR MAKING CYCLIC AMINES

Philip F. Jackisch, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 16, 1984, Ser. No. 601,032

Int. Cl.³ C07C *85/00, 85/08*

U.S. Cl. 564—446 **17 Claims**

1. A process for the reductive amination of a saturated cyclic ketone which comprises reacting said saturated ketone with an amine in the presence of hydrogen and a hydrogenation catalyst whereby said saturated cyclic ketone is converted to the corresponding cyclic amine.

4,521,625

DIOXOCYCLOBUTENE COMPOUNDS

Thomas H. Brown, Tewin, and Rodney C. Young, Bengeo, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

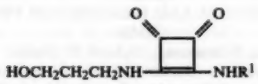
Filed Sep. 26, 1983, Ser. No. 535,468

Claims priority, application United Kingdom, Oct. 2, 1982, 8228207; Nov. 13, 1982, 8232468

Int. Cl.³ C07C *87/45*

U.S. Cl. 564—461 **4 Claims**

1. A compound of the formula (I):



(I)

wherein R^1 is hydrogen or a C_{1-6}alkyl group.

4,521,626

PREPARATIONS OF ALKANOLAMINES

Larry D. Kershner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 384,813, Jun. 3, 1982, Pat. No. 4,465,837. This application Apr. 19, 1984, Ser. No. 602,041

Int. Cl.³ C07C *85/20*

U.S. Cl. 564—487 **9 Claims**

1. A process for preparing monoisopropanolamine, diisopropanolamine or a mixture thereof comprising:

(a) contacting urea and propylene carbonate in the presence of an initiator at a temperature of from about 120° C. to about 200° C. to thereby prepare 5-methyl-2-oxazolidinone, 5-methyl-3-(2-hydroxypropyl)-2-oxazolidinone or mixtures thereof, and

(b) hydrolyzing the 5-methyl-2-oxazolidinone, 5-methyl-3-(2-hydroxypropyl)-2-oxazolidinone or mixture thereof.

4,521,627

METHOD OF PREPARING ALKALI METAL SALTS OF ORGANIC DIAMINES

Peter W. D. Mitchell, Freehold, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Feb. 6, 1984, Ser. No. 577,514

Int. Cl.³ C07C *87/14*

U.S. Cl. 564—511 **5 Claims**

1. A method of preparing alkali metal salts of organic diamines, which comprises; reacting said metal with a molar excess of said diamine in the presence of a catalytic proportion of a transition metal compound at a temperature of from about 20° C. to reflux temperature for the reaction mixture.

4,521,628

RECOVERY OF ARYLBORANES

John J. Ostermaier, Orange, Tex., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jul. 11, 1983, Ser. No. 512,686

Int. Cl.³ C07F *5/02*

U.S. Cl. 568—1 **6 Claims**

1. A process for the recovery of arylboranes from their adducts which adducts are dissolved in a basic aqueous solution comprising neutralizing the adduct in at least two stages wherein up to about 90% of the adduct present in the solution is neutralized in the first stage to an initial pH and at least a portion of the remainder of the unneutralized adduct present in the solution is neutralized in the second stage to a final pH which is lower than the initial pH.

4,521,629

METHOD FOR THE PREPARATION OF 1,5-BIS-ARYL-1,4-PENTADIEN-3-ONES

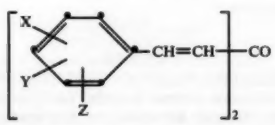
Nicholas A. Cortese, Jr., Trenton, N.J., and William H. Gastrock, Vicksburg, Miss., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 29, 1984, Ser. No. 626,168

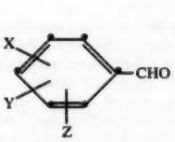
Int. Cl.³ C07C *45/61*

U.S. Cl. 568—313 **9 Claims**

1. A method for the preparation of a compound of formula:

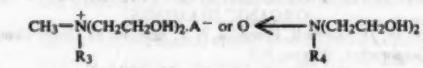


wherein X, Y, and Z each are independently haloalkyl, C_1–C_3 alkoxy, C_1–C_3 haloalkoxy, halogen, NO_2, CN, R_1R_2N—, or $R_1R_2NO_2S$—; R_1 and R_2 each are hydrogen or C_1–C_3: alkyl; comprising: admixing 2 molar equivalents of an aldehyde of formula:



wherein X, Y, and Z are as herein above defined; with an inert solvent C_5–C_8 aliphatic hydrocarbons, petroleum distillates, benzene, toluene, or xylene; water, and with an amount of from

3 mol % to 25 mol % of the above aldehyde a base of an alkali metal hydroxide, carbonate, or bicarbonate as an aqueous solution; adding to the above mixture of from 1 to 1.1 molar equivalents of acetone, and from 1% by weight to 10% by weight on the weight of the above aldehyde, a phase transfer agent selected from formula:



wherein R_3 is $-(CH_2)_{11}CH_3$, $-(CH_2)_8CH{=}CH-(CH_2)_7CH_3$, or $-(CH_2)_{17}CH_3$; R_4 is tallowyl or $-(CH_2)_{11}CH_3$; A is Cl, Br, or I; at a temperature range of from 20° C. to 55° C. over a period of time of from one to three hours; stirring the mixture at 20° C. to 55° C. for one to three hours; diluting the mixture with a C_1–C_3 alcohol, and adjusting the pH of the thus obtained mixture with a mineral acid in the range of from pH 5 to pH 1; and then heating the reaction mixture at reflux of from one to three hours, or until the reaction is essentially complete.

4,521,630

PROCESS FOR THE PREPARATION OF ALDEHYDES

Freddy Wattimena, and Hendricus J. Heijmen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 9, 1983, Ser. No. 521,777

Claims priority, application United Kingdom, Aug. 9, 1982, 8222902

Int. Cl.³ C07C *45/41*

U.S. Cl. 568—435 **16 Claims**

1. Process for the preparation of aldehydes, by the reduction of carboxylic acids or esters, anhydrides or salts thereof, which comprises hydrogenating as feed at least one compound of the general formula R'COOR, wherein R represents a hydrogen atom, an alkyl or an acyl group, or a metal and R' represents an optionally substituted hydrocarbyl group having at most two alpha-hydrogen atoms, provided it has at most one beta-hydrogen atom, in case it has two alpha-hydrogen atoms, in a reaction zone at a temperature of 250° to 550° C. a weight hourly space velocity of 0.1 to 4.0 kg/kg/h and a molar ratio of hydrogen gas to feed compound of more than 0.1 in the presence of a catalyst comprising at least one rare earth metal and iron on a gamma-alumina carrier, wherein the total amount of iron and rare earth metals lies between 0.01 and 0.2 gat/100 g of carrier and the atomic ratio of iron to rare earth metal lies between 0.4 and 4.0; and separating an aldehyde-containing product from said reaction zone.

4,521,631

PROCESS FOR PRODUCING ACETALDEHYDE

Yasuyuki Nishimura; Mutsuo Yamada; Yoshijiro Arikawa; Taiji Kamiguchi; Takanori Kuwahara, and Hirotoshi Tanimoto, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,336

Claims priority, application Japan, Jun. 13, 1983, 58-104291; Mar. 5, 1984, 59-41800

Int. Cl.³ C07C *45/28, 45/33*

U.S. Cl. 568—478 **11 Claims**

1. In the process for producing acetaldehyde by oxygen-oxidizing ethylene in the presence of a metal complex catalyst,

the improvement which comprises using as said metal complex catalyst, a composite catalyst comprising a complex ($M_mX_n.L_l$) capable of forming an oxygen complex by coordination thereof with oxygen and a complex catalyst ($M'_{m'}X_{n'}.L'_{l'}$) capable of forming an ethylene complex by coordination thereof with ethylene, wherein M represents a transition metal belonging to at least one group selected from the group consisting of Group I, Groups IV~VII and iron group in Group VIII of the periodic table; X represents an anion; ligand L represents an organic phosphorous compound; M' represents a transition metal belonging to platinum group in Group VIII of the periodic table; ligand L' represents at least one compound selected from the group consisting of a nitrile, an organic fluorine compound and an organic phosphorous compound; m, m' and n, n' represent a number of atoms of said transition metals M, M' and said anions X, X', respectively; and l and l' represent a number of said ligands L and L', respectively.

4,521,632

PURIFICATION OF AQUEOUS GLYOXAL SOLUTIONS

Gerhard Wickenhaeuser, Birkenheide; Bernd Heida, Boehl-Iggelheim; Fritz Graf, Speyer, and Leopold Hupfer, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 23, 1984, Ser. No. 572,948

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1983, 3303010

Int. Cl.³ C07C *45/78, 45/80*

U.S. Cl. 568—492 **14 Claims**

1. In a process for the purification of an aqueous glyoxal solution which contains acids as impurities by treatment with a solution of a tertiary amine in an organic solvent, the improvement which comprises:

preparing as the treating agent a solution which contains from 20 to 60% by weight of a tertiary amine and from 80 to 40% by weight of an alcohol which is not infinitely miscible with water; and

carrying out the treatment by mixing the two solutions at a temperature of from about room temperature up to 60° C. and during a residence time of less than 5 minutes.

4,521,633

BROMINATION PROCESS

Joseph J. Pedjac, Mt. Pleasant, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 19, 1983, Ser. No. 496,037

Int. Cl.³ C07C *41/22*

U.S. Cl. 568—639 **17 Claims**

1. A process for the preparation of perbrominated aromatic compounds comprising adding an aromatic compound to a brominating agent in methylene chloride in the presence of a catalyst at a temperature of about 15° C. or lower and then raising the temperature of the resulting mixture to an elevated temperature in order to achieve substantial perbromination of the aromatic compound.

4,521,634

ETHER CARBINOLS AND PROCESS FOR PREPARING SAME

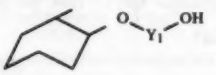
Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 533,915, Sep. 19, 1983, which is a continuation-in-part of Ser. No. 507,292, Jun. 23, 1983, abandoned. This application Jan. 26, 1984, Ser. No. 574,150

Int. Cl.³ C07C *43/188, 41/06*

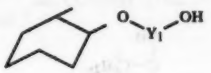
U.S. Cl. 568—665 **3 Claims**

1. The ether carbinol having the structure:



wherein Y_1 is C_4–C_5 alkenylene.

3. A process for producing a compound defined according to the genus:



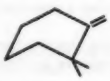
wherein Y_1 is a moiety selected from the group consisting of:

C_4–C_5 alkylene;

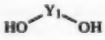
C_4–C_5 alkenylene; and

C_4–C_5 alkynylene

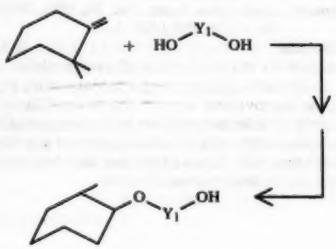
comprising the step of adding to camphene defined according to the structure:



a diol defined according to the structure:

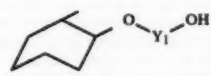


thereby effecting the reaction:



wherein Y_1 represents C_4–C_5 alkylene, C_4–C_5 alkenylene or C_4–C_5 alkynylene; the reaction taking place in the presence of a Lewis acid catalyst at a temperature of from about 60° C. up to about 100° C. at a pressure in the range of from about 1 atmosphere up to about 10 atmospheres; the time of reaction varying from about 2 hours up to about 20 hours; the mole ratio of diol having the structure:

to camphene varying from about 1:2 up to about 3:1 and then recovering the compound having the structure:



from the reaction mass.

4,521,635

BIS(ALPHA-ALKYLBENZYL)ETHER PRODUCTION

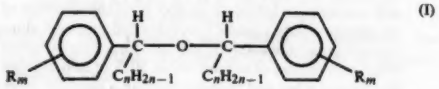
Frank Stevens, Baytown, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 16, 1983, Ser. No. 562,366

Int. Cl.³ C07C *41/09, 43/20*

U.S. Cl. 568—659 **18 Claims**

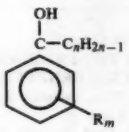
1. Process for the production of bis-(alpha-alkylbenzyl)ethers corresponding to the formula:



(I)

wherein, R is a member selected from the group consisting of lower alkyl, lower haloalkyl, chloro, bromo, sulfo and nitro radicals; m is an interger not greater than 3 and n is an integer of from 1 to 7, inclusive, comprising:

(a) heating, while removing water of dehydration as formed, an alpha alkylbenzyl alcohol of the formula:



(II)

wherein, R, m and n are as defined above, with agitation, at a temperature below about 200° C. in the presence of a mineral acid treated finely divided calcined alumina catalyst, present in catalytic amount, for a time sufficient to effect conversion of at least about 50% of said alcohol to the desired ether and thereby forming a reaction product mixture;

(b) introducing a basic compound capable of neutralizing acidity of said catalyst to the reaction product mixture of Step (a), above, in an amount sufficient to deactivate the catalyst;

(c) separating the deactivated catalyst from the reaction mixture; and

(d) recovering the desired bis(alpha-alkylbenzyl)ether from the reaction product mixture.

4,521,636

PREPARATION OF BIS(ALPHA-ALKYLBENZYL)ETHERS

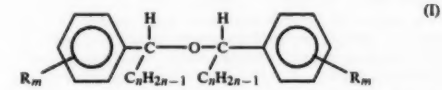
Wayne A. Kriel, Westchester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 16, 1983, Ser. No. 562,365

Int. Cl.³ C07C *41/09*

U.S. Cl. 568—659 **15 Claims**

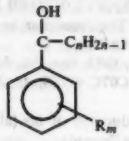
1. Process for the production of bis-(alpha-alkylbenzyl)ethers corresponding to the formula:



(I)

wherein, R is a member selected from the group consisting of lower alkyl, lower haloalkyl, chloro, bromo, sulfo and nitro radicals; m is an integer not greater than 3 and n is an integer of from 1 to 7, inclusive, comprising:

(a) heating, while removing water of dehydration as formed, an alpha alkylbenzyl alcohol of the formula:


(II)

wherein, R, m and n are as defined above, with agitation, at a temperature below about 200° C. in the presence of an aluminum sulfate treated finely-divided calcined alumina catalyst present in catalytic amount, for a time sufficient to effect conversion of at least about 50% of said alcohol to the desired ether and thereby forming a reaction product mixture;

(b) introducing a basic compound to the reaction product mixture of Step (a), above, in an amount sufficient to deactivate the catalyst;

(c) separating the deactivated catalyst from the reaction mixture; and

(d) recovering the desired bis(alpha-alkylbenzyl)ether from the reaction product mixture.

4,521,637

PROCESS FOR THE PRODUCTION OF BIS(ALPHA-ALKYLBENZYL) ETHERS

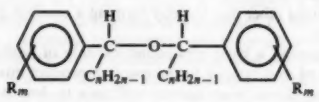
Frank Stevens, Baytown, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 16, 1983, Ser. No. 562,364

Int. Cl.³ C07C *41/09*

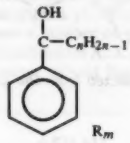
U.S. Cl. 568—659 **18 Claims**

1. Process for the production of bis-(alpha-alkylbenzyl) ethers corresponding to the formula:


(I)

wherein, R is a member selected from the group consisting of lower alkyl, lower haloalkyl, chloro, bromo, sulfo and nitro radicals; m is an integer not greater than 3 and n is an integer of from 1 to 7, inclusive, comprising:

(a) heating, while removing water of dehydration as formed, an alpha alkylbenzyl alcohol of the formula:


(II)

wherein, R, m and n are as defined above, with agitation, at a temperature below about 200° C. in the presence of an aryl sulfonic acid treated finely divided calcined alumina catalyst, present in catalytic amount, for a time sufficient to effect conversion of at least about 50% of said alcohol to the desired ether and thereby forming a reaction product mixture;

(b) introducing a basic compound to the reaction product mixture of Step (a), above, in an amount sufficient to deactivate the catalyst;

(c) separating the deactivated catalyst from the reaction mixture; and

(d) recovering the desired bis(alpha-alkylbenzyl) ether from the reaction product mixture.

4,521,638

PROCESS FOR PREPARATION OF TERTIARY OLEFINS

Koichi Kida; Tetsuo Aoyama, and Takako Uchiyama, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 580,633

Claims priority, application Japan, Feb. 26, 1983, 58-31373

Int. Cl.³ C07C *1/00, 1/20*

U.S. Cl. 585—640 **20 Claims**

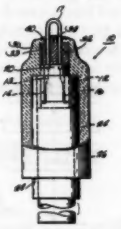
1. In a process for the preparation of tertiary olefins which comprises catalytically decomposing a tertiary ether to a tertiary olefin, the improvement wherein the catalytic decomposition of the tertiary olefin is carried out in the presence of a solid phosphoric acid catalyst which has been calcined at a temperature not lower than 500° C. in an inert gas, said decomposition being carried out in the presence of steam.

4,521,639

REPEATING THERMOCOUPLE

Richard A. Falk, 519 Westminster Dr., Waukesha, Wis. 53186

Filed Oct. 31, 1983, Ser. No. 546,967
Int. Cl.³ H01L 35/02
U.S. Cl. 136—234 2 Claims



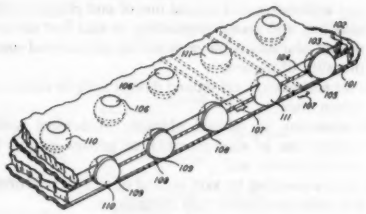
1. In a repeating use immersion thermocouple assembly for a molten metal bath including a support tube, a temperature sensing element having a U-shaped projecting tip with spaced legs and a rigid support means in said cavity for supporting said temperature sensing element and enabling manipulation of the element in a molten metal bath, the improvement comprising a refractory fiber sleeve having a cavity at one end thereof for receiving said U-shaped projecting tip, said U-tube extending through said cavity and a thermosetting sand packing filling said cavity and surrounding said U-shaped tube, and a refractory fiber gasket spanning said open end of said sleeve and refractory cement cap over said gasket and sealing the end of said fiber sleeve around the projecting tip and encasing said refractory fiber gasket.

4,521,640

LARGE AREA, LOW TEMPERATURE PROCESS, FAULT TOLERANT SOLAR ENERGY CONVERTER

Jules D. Levine, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 299,695, Sep. 8, 1981, Pat. No. 4,407,320. This application Jul. 21, 1983, Ser. No. 515,841
The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.
Int. Cl.³ H01L 31/06
U.S. Cl. 136—250 5 Claims



1. A flexible radiant energy converter system comprising:

a plurality of substantially spherical cells of semiconductor material, a first portion of each cell being of semiconductor material of one conductivity type and a second portion of each cell being of semiconductor material of the other conductivity type;

a first flexible malleable metal foil sheet having a plurality of perforations formed therethrough;

each of said plurality of substantially spherical cells of semiconductor material being received within a respective perforation in said first flexible malleable metal foil sheet so as to be substantially centered therein with one of said first and second portions of said cell in electrical ohmic contact with said first flexible malleable metal foil sheet; and

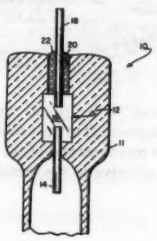
a second flexible malleable metal foil sheet disposed in spaced substantially parallel relation to said first flexible malleable metal foil sheet and in electrical ohmic contact with the other of said first and second portions of each of said plurality of cells of semiconductor material.

4,521,641

SOLDER GLASS AND ELECTRICAL DEVICE EMPLOYING THE SAME

Richard G. Snell, Topsfield, and Fredrick A. Loughridge, Ipswich, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 4, 1984, Ser. No. 568,028
Int. Cl.³ H01J 5/00; H05K 5/06
U.S. Cl. 174—50.64 4 Claims



1. A seal for electrical devices comprising a body of substantially fused silica and at least one electrically conductive member sealed therein, said member comprising a proximal portion projecting within said body, an intermediate thin foil portion hermetically sealed within said body, and a distal portion projecting exteriorly of said body, and a capillary passage surrounding said distal portion and extending to said intermediate portion, said capillary passage being substantially filled with a solder glass that is opaque to visible radiation and is not deleterious to molybdenum, said solder glass forming, at elevated temperatures above about 350° C., a molten seal which prevents oxidation of said thin foil portion said solder glass comprising Sb_2O_3, B_2O_3 and V_2O_5.

4,521,642

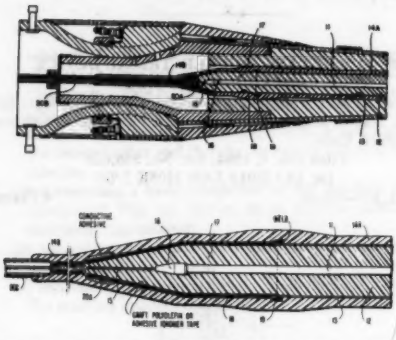
SEALED CONNECTION CONNECTING AN UNDERSEA COAXIAL CABLE TO A REPEATER AND A METHOD OF MAKING SAME

Jean-Patrick Vives, Calais, France, assignor to Les Cables de Lyon, Lyons, France

Filed Jun. 3, 1981, Ser. No. 270,197
Claims priority, application France, Jun. 5, 1980, 80 12501
Int. Cl.³ H02G 15/14
U.S. Cl. 174—70 S 4 Claims

1. A sealed connection between an undersea coaxial line cable and a length of coaxial access cable connected to a repeater; the line cable comprising, in a radially outward direction, in order, an axial conductor, insulation, a return path conductor and an outer insulation sheath; the access cable comprising, in a radially outward direction, in order, an axial conductor, insulation, metal braiding forming a return path conductor, and an outer insulation sheath; and the connection comprising a conical conductive metal connection part for interconnecting the axial conductors, a surface moulded layer of insulating thermoplastic material, conductive connection means for interconnecting the return path conductors of the line cable and the access cable, and means for reconstituting the insulation sheathing between the line cable and the access cable, the improvement wherein said conductive connection

means for interconnecting the return path conductors comprises an aluminum flared tube fitted tightly over the surface-moulded insulation, with a layer of graft polyolefin or adhesive ionomer tape wound helically around the surface moulding and being sandwiched in between the moulding and the flared



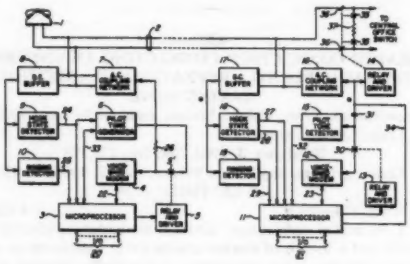
tube, the wider end of the flared tube having a flared rim receiving and being welded to the return path conductor of the line cable, and the narrower end of the flared tube being glued with conductive adhesive to the metal braiding of the access cable.

4,521,643

APPARATUS FOR TRANSMITTING INFORMATION VIA TELEPHONE LINES

Claude R. Dupuis, Kanata, and Lorne C. Hinz, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 18, 1983, Ser. No. 467,585
Claims priority, application Canada, Jan. 10, 1983, 419146
Int. Cl.³ G06B *26/00*; H04M *11/04, 11/06*
U.S. Cl. 179—2 DP **42 Claims**



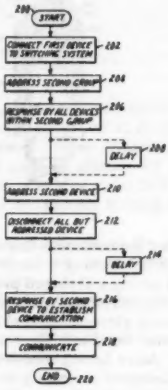
1. Apparatus comprising a telephone subscriber line connected at a first end to a telephone and at a second end to a central office, means for transmitting information via the line when the telephone is on-hook, means for applying a pilot tone to the line at the first end when the telephone is off-hook, means coupled to the line at the first end for detecting the presence of ringing signals on the line, means for selecting one of two frequencies of the pilot tone applied to the line when the telephone goes off-hook in dependence upon the detection of the presence of ringing signals, and means for monitoring the pilot tone at the second end of the line.

4,521,644

METHOD OF ESTABLISHING COMMUNICATION

Samuel Bernard, Jr., Vadnais Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 22, 1983, Ser. No. 525,301
Int. Cl.³ H04M *9/00*
U.S. Cl. 179—2 DP **9 Claims**



1. In a communication system having a plurality of groups and a plurality of devices within at least one of said plurality of groups, where said plurality of devices within said at least one of said plurality of groups are connected by a dedicated line, where communication between said plurality of groups is established by a randomly addressable switching system, where each of said plurality of groups has a unique address within said randomly addressable switching system, where each of said plurality of devices within each of said plurality of groups has a unique identification code within said dedicated line, a method of establishing communication between a first device in a first one of said plurality of groups with a second device which is a selected one of said plurality of devices in a second one of said plurality of groups, comprising:

connecting said first device to said randomly addressable switching system by way of said dedicated line within said first one of said plurality of groups;

group addressing said second one of said plurality of groups;

connecting and group responding to said first device by all of said plurality of devices within said second one of said plurality of groups;

device addressing said second device with its unique identification code;

disconnecting all of said plurality of devices within said second one of said plurality of groups except for said second device; and

device responding by said second device to said first device that communication may commence.

4,521,645

FIRE ALARM SYSTEM

Robert A. Carroll, 441 Neatherwood Crescent Dr., Altamonte Springs, Fla. 32701

Filed Jun. 16, 1983, Ser. No. 505,371
Int. Cl.³ H04M *11/04*
U.S. Cl. 179—5 R **12 Claims**

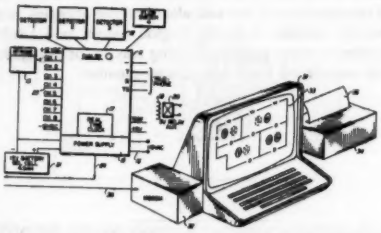
1. An alarm system comprising in combination:

a plurality of automatic dialers positioned in a building and each being connected to a telephone line;

a plurality of detectors located in a building, each detector being connected to one of said plurality of automatic dialers for actuating said automatic dialer responsive to

said detector being actuated and for generating detector information indicative of the location of said detector;

computer means having a central processing unit microprocessor and storage means therein operatively connected to each of said plurality of automatic dialers over telephone lines for receiving the detector information upon actuation of a detector and for storing and transmitting said detector information, said computer means storage means having additional stored information thereon including data indicating the floor plan of a portion of said building and the location of each detector on said building



floor plan, said computer means having a coupling to the outside of a building for coupling to a portable terminal for displaying the detector information and the additional information indicating the location of each detector on said building floor plan without having to enter the building; and

a remote terminal for receiving stored computer information over a phone line from said computer storage means and adapted to receive and store detector information, indicating the location of each detector on said building plan whereby a central alarm system can alert a central station and provide stored information on detector location.

4,521,646

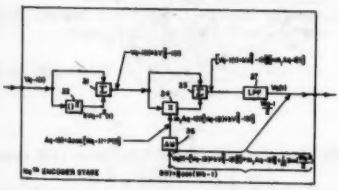
METHODS AND APPARATUS FOR BANDWIDTH REDUCTION

Edward P. Callaghan, 2021 New Hyde Park Rd., New Hyde Park, N.Y. 11040

Continuation of Ser. No. 163,270, Jun. 26, 1980, abandoned, which is a continuation-in-part of Ser. No. 34,845, Apr. 30, 1979, abandoned. This application Dec. 2, 1981, Ser. No. 326,472

Int. Cl.³ G10L *1/00*

U.S. Cl. 375—122 **30 Claims**



1. A method of reducing the bandwidth of an intelligence-bearing signal comprising the steps of:

(a) earmarking said signal by adding thereto a nonlinear signal obtained from said intelligence-bearing signal;

(b) multiplying the earmarked signal resulting from step (a) above with an angle-modulated carrier having a radian carrier frequency numerically equal to the nominal bandwidth of said intelligence-bearing signal thereby to effectively reverse the signal spectrum of said intelligence-bearing signal over a predetermined frequency range;

(c) summing the multiplied signal resulting from step (b) above with the earmarked signal resulting from step (a) above; and then

(d) filtering the summed signal resulting from step (c) above in a low-pass filter.

4,521,647

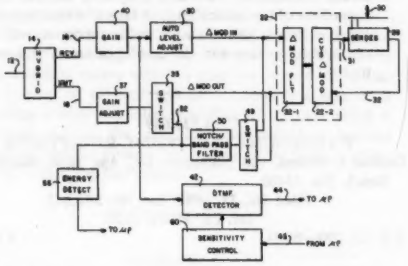
TONE DETECTION SYSTEM AND METHOD

Peter D. Olson, Saratoga, and Samuel R. Hawes, Jr., Palo Alto, both of Calif., assignors to Octel Communications, Inc., San Jose, Calif.

Filed Feb. 17, 1984, Ser. No. 581,283

Int. Cl.³ H04M *11/00*

U.S. Cl. 179—84 VF **6 Claims**



1. In a telephone system, tone detection apparatus comprising

means for connecting an outgoing analog voice signal to a telephone line,

detect means connected to said telephone line for receiving an incoming analog signal to detect first control signals, and

means responsive to said detected signals for filtering second control signals from said outgoing analog signal for a first predetermined period of time, such first predetermined period of time being such as not to effect any human perceptible incoming or outgoing signals.

4,521,648

AUTOMATIC DIALER FOR TELEPHONE NUMBERS

Paul Hegi, Bernex, Switzerland, assignor to Lupa Finances S.A., Luxembourg, Luxembourg

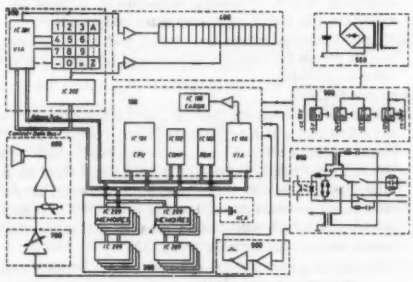
Division of Ser. No. 411,038, Aug. 24, 1982, Pat. No. 4,473,720. This application Jul. 6, 1984, Ser. No. 628,262

Claims priority, application Switzerland, Sep. 23, 1981, 6127/81

The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.

Int. Cl.³ H04M *1/274*

U.S. Cl. 179—90 B **16 Claims**



1. In an apparatus for automatically output pulsing telephone numbers to a telephone network, said apparatus comprising a

control means, a memory means and a keyboard means, the improvement in which:

said memory means comprises a removable portion for storing telephone number identification information including local network identification for each telephone number;

said memory means comprises a fixed portion for storing local network identification information for said fixed portion;

said keyboard means is adapted to select telephone number identification information for each telephone number stored in said removable portion;

said control means responds to and generates necessary output pulses corresponding to telephone number identification information for each telephone number selected regardless of the coincidence or lack of coincidence of the local network identification information stored in the removable portion and the fixed portion of the memory means.

4,521,649

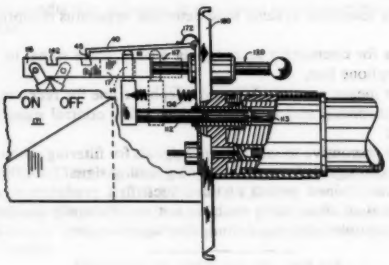
WATERTIGHT ELECTRICAL RECEPTACLE

Gunnar I. Nelson, 100 Lakeshore Dr., Apt. 1656, North Palm Beach, Fla. 33408

Filed Jul. 11, 1983, Ser. No. 501,142

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—50 B **9 Claims**



1. In a waterproof device having means for opening and closing an electrical circuit and an electrical receptacle for receiving an electrical plug, the improvement which comprises:

a housing

plug receiving means, said plug receiving means being fixed to said housing,

a latching member;

electrical pin engaging means, said electrical pin engaging means having a main body region supported for movement within said plug receiving means between a first position and a second position, and a latching member engaging region extending substantially normal to said electrical pin engaging means main body region;

first spring biasing means for biasing said electrical pin engaging means for movement from said first position to said second position;

a circuit breaker;

circuit breaker actuating member, said circuit breaker having a first end which engages said circuit breaker actuating member and a second end which extends outside of said housing, and being mounted for movement from an actuating first position in which said circuit breaker actuating member causes said circuit breaker to be OFF, to a second position in which said circuit breaker actuating member causes said circuit breaker to be ON;

interconnecting means between said circuit breaker actuating member and said electrical pin engaging means, said interconnecting means causing said circuit breaker actuating member to move from said actuating first position to said actuating second position in response to movement of said electrical pin engaging means from said pin first position to said second pin position;

said latching member having a first end supported by said housing and a second end which engages said circuit breaker actuating member and precludes movement of said circuit breaker actuating member toward said second actuating position;

second spring biasing means associated with said latching member to bias said latching member for engagement with said circuit breaker actuating member;

said electrical pin engaging means being moveable in response to the insertion of an electrical pin into said electrical receptacle such that said electrical pin engaging means latching member engaging region causes said latching member to move against its spring bias out of engagement with said circuit breaker actuating member.

4,521,650

MOUNTING APPARATUS FOR A CONTROL LEVER

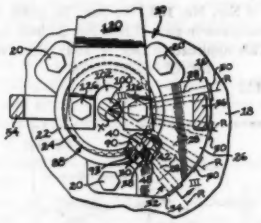
Charles W. Oswald, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/00489, § 371 Date Apr. 19, 1982, § 102(e) Date Apr. 19, 1982, PCT Pub. No. WO83/03577, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 19, 1982, Ser. No. 432,898

Int. Cl.³ B60K *20/00*

U.S. Cl. 200—61.88 **18 Claims**



1. A mounting apparatus (**10**) for a control lever (**12**), comprising:

a support member (**16**) defining a generally cylindrical aperture (**24**) along a central axis (X);

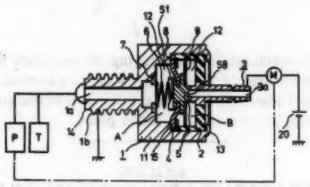
the control lever (**12**) defining a generally cylindrical portion (**90**) having a groove (**92**) disposed therearound and a plurality of indentations (**93**) on the cylindrical portion (**90**) spaced along said groove (**92**) in a common plane (A—A) normal to the central axis (X), the cylindrical portion (**90**), of the control lever (**12**) being rotatably received within the aperture (**24**) of the support member (**16**); and

means (**38**) for positioning the control lever (**12**) both axially and circumferentially within the support member (**16**) by selected engagement with the groove (**92**) and the indentations (**93**).

4,521,651
DIAPHRAGM APPARATUS HAVING A MAGNETICALLY IMPARTED HYSTERESIS CHARACTERISTIC

Akio Matsumoto, and Mitsuyoshi Yokota, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1983, Ser. No. 534,506
Claims priority, application Japan, Oct. 12, 1982, 57-155638[U]
Int. Cl.³ H01H *35/40*
U.S. Cl. 200—83 R 13 Claims



8. Pressure sensitive electrical switching apparatus comprising:

a case having first and second ports, a diaphragm means mounted air tightly within the case for activating and deactivating a switch, said diaphragm means partitioning the case into two chambers respectively connected to said first and second ports, and spring biasing means for biasing said diaphragm means in a first direction,

said spring biasing means fixed to said case at one end thereof and to said diaphragm means at another end thereof,

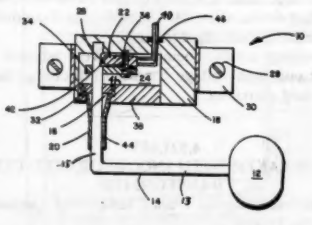
said diaphragm means fixed at one area thereof to said case and having a movable area,

first and second magnetic means connected to said diaphragm means, said first magnetic means connected to said movable area of said diaphragm means and said second magnetic means connected to said fixed area of said diaphragm means for providing additional force opposing said spring biasing means, thereby establishing a hysteresis in a pressure-position characteristic of said pressure sensitive electrical switching apparatus for a predetermined range of positions of said diaphragm means.

4,521,652
VISUALLY AND MECHANICALLY TESTABLE SUBMERSIBLE COMPOSITE

John E. Durand, 27441 Ganso, Mission Viejo, Calif. 92691

Filed Nov. 2, 1983, Ser. No. 547,938
Int. Cl.³ H01H *35/18*
U.S. Cl. 200—84 B 3 Claims



1. A visually and mechanically testable submersible composite, comprising:

a switch casing having an interior surface defining a gas filled switch cavity and a cap orifice opening into the switch cavity;

a switch mechanically coupled to a surface defining the switch cavity and having electrical leads potted in a leak tight potting through the surface defining the switch cavity to the outside of the switch casing;

a float;

a float coupling means coupling the float to the switch via the cap orifice to mechanically actuate and control the switch;

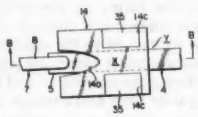
a cap having an interior surface disposed around a gas permeable coupling bearing, the cap having an exterior surface substantially identical to the interior surface of the cap orifice whereby the cap may be inserted into and substantially fill the cap orifice in a substantially gas tight coupling, thereby increasing pressure on the gas in the switch cavity when the cap is inserted; and

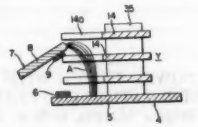
a visual and mechanical test means having an interior surface coupled in a leak tight coupling around that portion of the float coupling means which is near but outside of the cap and having an exterior surface coupled in a leak tight coupling around the interior surface of the cap which is disposed around the gas permeable coupling bearing which is disposed around that portion of the float coupling means within the cap orifice.

4,521,653
CIRCUIT BREAKER WITH ARC LIGHT ABSORBER

Hajimu Yoshiyasu; Shirou Murata, both of Itami; Fumiyuki Hisatsune, Fukuyama; Shinji Yamagata, Fukuyama, and Junichi Terachi, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1983, Ser. No. 485,070
Claims priority, application Japan, Apr. 15, 1982, 57-64380; Apr. 15, 1982, 57-64381; Apr. 15, 1982, 57-64382; Apr. 15, 1982, 57-64383; Apr. 15, 1982, 57-64388; Apr. 15, 1982, 57-64389; Jun. 15, 1982, 57-90605[U]; Oct. 22, 1982, 57-186306
Int. Cl.³ H01H *33/04, 9/30*
U.S. Cl. 200—144 C 15 Claims





1. A circuit breaker with an arc light absorber comprising:

a pair of electric contactors contained in an insulating container for opening or closing an electric circuit;

electric conductors extending to said electric contactors and contacts on said conductors; and

a pair of side walls in spaced opposed relation to each other and spaced from each other in a direction transverse to said contactors and spaced from said contactors in the direction in which the arc produced between said contacts when said contactors are opened expands from said contactors and defining a space between them to receive the expanding arc, said side walls having a size for absorbing light from the arc;

said side walls being formed of a heat resistant, electrically insulating, light absorbing material having more than 35% apparent porosity.

4,521,654

HIGH VOLTAGE DISCONNECT SWITCH EMPLOYING PRE-CONTACT PIECES

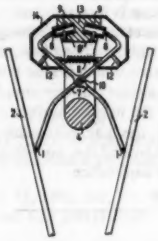
Wolfgang Eberhardt, Kassel-Harlh; Dietrich Hoffmann; Karl Kriechbaum, both of Kassel, and Erwin Rohde, Helsa, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 26, 1983, Ser. No. 536,033

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 3235353

Int. Cl.³ H01N *33/12*

U.S. Cl. 200—146 R 13 Claims



1. A high voltage disconnect switch, comprising:

a countercontact piece having switch countercontacts and being arranged for connection to a source of high voltage;

resilient pre-contact pieces insulatingly connected to said countercontact piece and including switch contacts disposed for contacting said switch countercontacts; and

movable primary contact pieces arranged to be movable from a first position of separation from said pre-contact pieces and said countercontact piece to a second position in which said primary contact pieces are in contact with said pre-contact pieces but not with said countercontact piece and to a third position in which said primary contact pieces are in contact with both said pre-contact pieces and said countercontact piece;

wherein said pieces are configured and arranged relative to one another so that during the closing of said switch said countercontacts contact said contacts after said primary contact pieces are moved to the second position and before said primary contact pieces are moved to the third position, and during the opening of said switch said countercontacts separate from said contacts after said primary contact pieces are moved to the second position and before said primary contact pieces are moved to the first position.

4,521,655

ELECTRIC POWER SWITCH WITH SLOTTED COMMUTATION END PLATE

Hiroyuki Okado; Shigeru Masuda, both of Aichi, and Teijiro Mori, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1983, Ser. No. 463,359

Claims priority, application Japan, Feb. 3, 1982, 57-15749; Feb. 3, 1982, 57-15750; Mar. 19, 1982, 57-43935

Int. Cl.³ H01H *33/20*

U.S. Cl. 200—147 R 13 Claims

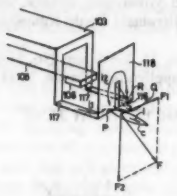
1. An electric power switch, comprising:

(a) a stationary contact (14),

(b) a movable contact (6) confronting said stationary contact and adapted to be moved into and out of engagement therewith,

(c) an arc runner (15) provided proximate said movable contact and electrically connected to said stationary contact, for providing a path of migration for the end of an arc formed when said movable and stationary contact engagement is broken, and

(d) a commutation plate (3) disposed near the path of movement of said movable contact, for providing a path of migration for the other end of said arc from said movable contact,



(e) said commutation plate having an end plate for guiding said other end of the arc, and a cut at a central portion of said end plate, whereby said other end of the arc is driven towards the center of said end plate.

4,521,656

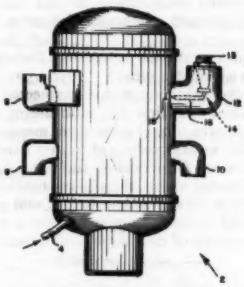
HIGH VOLTAGE GROUNDING DEVICE FOR PRESSURIZED EQUIPMENT

Jon W. Ogland, Millersville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 8, 1983, Ser. No. 549,532

Int. Cl.³ H01H *33/54*

U.S. Cl. 200—148 B 7 Claims



1. Safety apparatus for grounding high voltage within a pressurized metallic container to the container comprising:

a protruding metallic conduit affixed to the wall of said container and sealed to prevent loss of gas pressure within said container,

an electrode assembly positioned within said conduit for coupling high voltage to the interior of said container,

a high voltage contact affixed to said electrode, and

a grounding device affixed to the wall of said conduit having a moveable grounding contact,

said grounding contact being selectively adapted to bear against said high voltage contact to discharge high voltage to said container.

4,521,657

CIRCUIT BREAKER WITH INCORPORATED CURRENT TRANSFORMER

Edmond Thuries, Pusignan, France, assignor to Alsthom Atlantique, Paris, France

Filed Apr. 22, 1983, Ser. No. 487,472

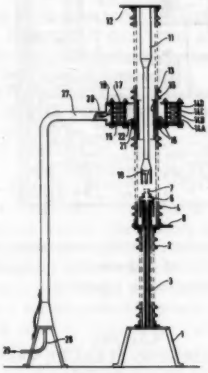
Claims priority, application France, Apr. 22, 1982, 82 06906

Int. Cl.³ H01N *33/59*

U.S. Cl. 200—148 R 8 Claims

1. A circuit breaker with incorporated current transformer, the circuit breaker comprising: a stand at ground potential; a

first insulating column supported by said stand and filled with a highly dielectric gas; a second insulating column coaxially supported by said first insulating column, said second insulating column serving as a cut-out chamber and including moving contacts; a first current terminal connected to said moving contacts; moving contact drive means operatively associated with said moving contacts; fixed contacts; and a second current terminal connected to said fixed contacts; the improvement comprising a third insulating column supported by said second column and being coaxial with said first and second columns, and at least one magnetic circuit and secondary



winding of a current transformer being disposed around said third column in the vicinity of its connection to said second column, the primary circuit of said current transformer being constituted by a conductor connecting said fixed contacts to said second terminal; and an anti-discharge screen being disposed inside said third column level with the current transformer and wherein a metal tube extends from the junction between said second and third columns and substantially down to ground level and which also serves to house electrical connections between said secondary winding and a measuring apparatus electrically connecting said anti-discharge screen to ground.

4,521,658

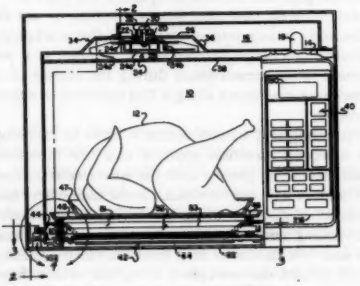
MICROWAVE OVEN SCALE APPARATUS

Alvin D. Wyland, Williamsburg; Duaine W. Smith, Tiffin, and Louis W. Blackburn, Norway, all of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Jan. 16, 1984, Ser. No. 571,157

Int. Cl.[3] H05B 6/68

U.S. Cl. 219—10.55 B **12 Claims**



1. Apparatus coupling weight from a tray in a microwave oven cavity through four holes in the floor thereof to a scale positioned below the floor, comprising:

a horizontal rectangular rigid frame having an aperture adjacent to each of the four corners, said frame being below said floor with said apertures aligning with said four holes in said floor;

a unitary stud inserted through each of said apertures, each of said studs having downwardly extending legs for straddling a support element of said scale, each of said studs having a collar for seating against the underside of said frame, each of said studs having a threaded body for tightening down a nut to seat against the top side of said frame to secure each of said studs to said frame, each of said studs having a threaded head; and

a microwave transparent post having a threaded bottom bore screwed down on each said threaded heads of said studs, each of said posts being adapted for inserting up through one of said holes in said cavity floor to collectively support said tray in said cavity, the height of each of said posts being adjustable by rotation on its respective stud.

4,521,659

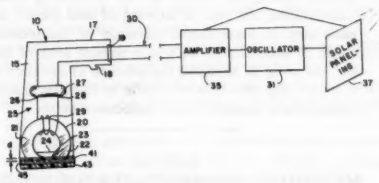
INDUCTION HEATING GUN

John D. Buckley, Newport News; Robert J. Swaim, Hampton; Robert L. Fox, Hayes, and David F. Johnston, Hampton, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 333,536, Dec. 22, 1981, abandoned, and a continuation of Ser. No. 69,429, Aug. 24, 1979, abandoned. This application Jun. 24, 1983, Ser. No. 507,623

Int. Cl.[3] H05B 6/08

U.S. Cl. 219—10.77 **6 Claims**



1. An induction heating apparatus for heating an electrically conductive workpiece through a nonconductive medium having a thickness d comprising:

electrical energy means for providing a line current at a fixed frequency and voltage;

a parallel tank circuit comprising a capacitor and an inductor connected in parallel with the tank circuit connected in parallel with said electrical energy means;

means for focusing the magnetic flux generated by said inductor through a nonconductive medium having a thickness d onto a conductive workpiece;

said means for focusing the magnetic flux generated by said inductor consists of a curved pole piece having two ends with a short gap between the two ends and with the inductor wrapped around the pole piece;

said short gap between the two ends of the pole piece being less than the maximum thickness of said pole piece, and the thickness of the nonconductive medium and the values of the capacitor and inductor being selected such that said parallel tank circuit is operating near resonance; and

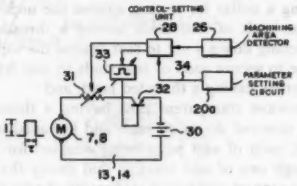
coil means connected across said inductor and located in said gap between two ends of the pole piece for pushing the magnetic flux between the two ends of the pole piece in the direction of the workpiece.

4,521,660

EDM FEED MOTOR CONTROL METHOD AND SYSTEM

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Feb. 17, 1982, Ser. No. 349,512
Claims priority, application Japan, Feb. 18, 1981, 56-23313
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 W 27 Claims



1. In a method of electroerosively machining an electrically conductive workpiece electrode with a tool electrode spacedly juxtaposed therewith across a dielectric-filled machining gap by applying a series of time-spaced electrical discharge pulses through the gap to remove material from the workpiece electrode, wherein a machining feed between the tool and workpiece electrodes, at least one of which is movable, is effected stepwise by motor means drivingly coupled with the movable electrode and arranged to be incrementally driven to advance the movable electrode in successive steps, thereby continuing electroerosive machining in the workpiece electrode and wherein the instantaneous area of the surface of the tool electrode which is in electroerosive relationship with the workpiece electrode varies as machining progresses, the improvement comprising the steps of:

(a) sensing the varying instantaneous area of said machining surface during the course of said machining feed; and

(b) controlling the rate of driving of said motor means for each step of incremental advance of the movable electrode in accordance with said sensed area of machining surface so as to maintain the amount of advance displacement of said movable electrode in each incremental step substantially constant over successive steps.

4,521,661

METHOD OF AND APPARATUS FOR HOLDING AGAINST MISPOSITIONING A THERMALLY DEFLECTABLE MEMBER IN AN OPERATING MACHINE TOOL

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

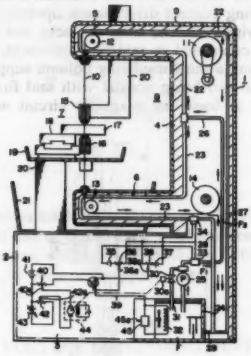
Filed Feb. 18, 1982, Ser. No. 349,968
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 W 20 Claims

1. A method of holding against mispositioning a work element in an operating machine tool in which a thermally deflectable member supporting said work element is disposed in a thermal environment of variable temperature created at least in part by operation of said machine tool so that said member undergoes thermal deflection to variable extent tending to cause the mispositioning of said element, said method comprising the steps of:

(a) passing a fluid through at least one passage formed in said thermally deflectable member of the machine tool performing a machining operation so that said member and said fluid are in heat-exchanging relationship in said operating machine tool; and

(b) establishing, for said machining operation, a preselected difference in temperature between said fluid flowing into said passage and said fluid flowing out of said passage;

(c) controlling at least one of parameters of said flowing fluid, which parameters include the rate of flow of the fluid through said passage and the temperature of the fluid flowing into said passage, so as to maintain said preselected difference in temperature in spite of changes in the temperature of said thermal environment during said machining operation, thereby maintaining the extent of thermal deflection of said member substantially constant while said machine tool is operating.

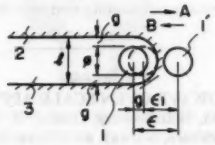


4,521,662

METHOD OF MEASURING FLEXURE VALUE OF WIRE ELECTRODE

Mitsuo Kinoshita, Hachioji, and Haruki Obara, Sagamihara, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP81/00345, § 371 Date Aug. 25, 1982, § 102(e) Date Aug. 25, 1982, PCT Pub. No. WO82/02165, PCT Pub. Date Jul. 8, 1982
PCT Filed Nov. 18, 1981, Ser. No. 413,375
Claims priority, application Japan, Dec. 29, 1980, 55-185432
Int. Cl.³ B23P 1/02, 1/12
U.S. Cl. 219—69 W 2 Claims



1. A method of measuring a value of flexure of a wire electrode, the flexure being caused by an electric discharge across a discharge gap, the method comprising the steps of:

(a) detecting by detection means whether or not the wire electrode comes into contact with the workpiece when electric discharge is temporarily stopped at a predetermined measurement point during the course of electric discharge machining along a first direction in a machining groove;

(b) retracting said wire electrode relative to said workpiece in a second direction opposite said first direction along said machining groove until the wire electrode comes out of contact with the workpiece in the case where they lie in contact, a distance of the retraction being measured, or advancing said wire electrode relative to said workpiece in said first direction until the wire electrode comes into contact with the workpiece in the case where they do not lie in contact, a distance of the advance being measured;

(c) calculating the flexure value in accordance with the following where g denotes the size of the discharge gap and ϵ_1 denotes said retraction distance;

$\epsilon = g + \epsilon_1$

(where ϵ indicates said flexure value)

(d) moving said wire electrode in a third direction orthogonal to said first machining direction until coming into contact with said workpiece, and measuring the size of the discharge gap from a value of the movement in said third direction.

4,521,663

PROCESS FOR DEPOSIT WELDING AND WEAR RESISTANT COATING ALLOY

Marinus C. Kesting, Spijkenisse, Netherlands, assignor to Swiss Aluminum Ltd., Chippis, Switzerland

PCT No. PCT/CH82/00114, § 371 Date May 16, 1983, § 102(e) Date May 16, 1983, PCT Pub. No. WO83/01588, PCT Pub. Date May 11, 1983

PCT Filed Oct. 28, 1982, Ser. No. 499,758

Int. Cl.³ B23K *9/04, 35/30*

U.S. Cl. 219—76.14 **28 Claims**

1. Process for depositing wear resistant, protective coatings of highly alloyed ferrous filler metals on base materials of carbon and manganese containing ferrous alloys which find application in particular in the carbon processing industry which comprises providing a base material having a carbon content up to a maximum of 0.22% and a manganese content larger than or equal to 5 times the carbon content, deposit welding directly on said base material using direct current in the ambient atmosphere with a wire or rod shaped filler metal, and selecting the strength of the current according to the diameter of the filler metal wire such that the quotient S wherein S=current/diameter (ampere/mm) is in the range 70–80.

4,521,664

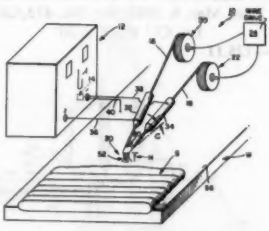
PROCESS AND APPARATUS FOR SURFACING WITH HIGH DEPOSITION AND LOW DILUTION

Robert F. Miller, Dover, Pa., assignor to Teledyne, Inc., York, Pa.

Filed Oct. 26, 1982, Ser. No. 436,816

Int. Cl.³ B23K *9/04*

U.S. Cl. 219—76.14 **13 Claims**



1. A method of surfacing materials comprising the steps of: providing a workpiece to be surfaced, providing a power supply, providing first and second electrode wires formed of material to be deposited on the workpiece, connecting the first electrode wire to a positive circuit of the power supply, connecting the second electrode wire to a negative circuit of the power supply, establishing a wire arc between the first and second electrode wires, the wire arc melting the electrode wires to form surfacing material, establishing a substrate arc between the positive electrode wire and the workpiece, depositing the surfacing material onto the workpiece, and initiating stress relief cracks during the surfacing process.

4,521,665

METHOD AND SYSTEM FOR DETERMINING WELD QUALITY IN RESISTANCE WELDING

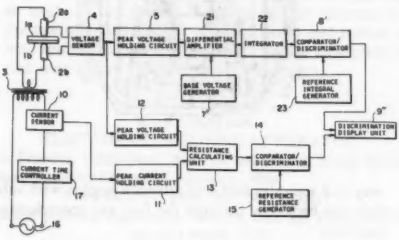
Shuji Nakata, Toyonaka; Yoshio Kawaguchi, Yokohama, and Akira Nishimura, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Division of Ser. No. 268,887, Jun. 1, 1981, Pat. No. 4,434,351. This application Feb. 27, 1984, Ser. No. 569,148

Claims priority, application Japan, Jun. 2, 1980, 55-72830

Int. Cl.³ B23K *11/24*

U.S. Cl. 219—117.1 **10 Claims**



1. A method of determining weld quality in resistance welding independently of variations in current path geometry due to electrode tip deformation, which comprises the steps of:

(a) detecting a plurality of values of an electrode voltage applied to welding electrodes between which the members to be welded are pinched;

(b) detecting a plurality of values of an electrode current flowing between the welding electrodes;

(c) calculating electrode resistance by dividing the electrode voltage by the electrode current;

(d) comparing the calculated electrode resistance immediately before the electrode current is cut off with a predetermined electrode resistance;

(e) comparing the detected electrode voltage values with a predetermined reference electrode voltage;

(f) calculating a sum total of the detected electrode voltage values in excess of the predetermined reference electrode voltage;

(g) comparing the calculated sum total of the detected electrode voltage values in excess of the reference voltage with a predetermined reference value; and

(h) determining that the weld quality is acceptable when both the calculated electrode resistance and the calculated sum total of the detected electrode voltage values lie within the respective allowable ranges therefor.

4,521,666

PLASMA ARC TORCH

Wayne S. Severance, Jr., Florence, and George T. Rogers, Society Hill, both of S.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 23, 1982, Ser. No. 452,452

Int. Cl.³ B23K *9/00*

U.S. Cl. 217—121 PY **8 Claims**

1. A method of operating a plasma arc torch having a nonconsummable electrode and a first and second arc constricting passageway each coaxially arranged relative to one another comprising the steps of:

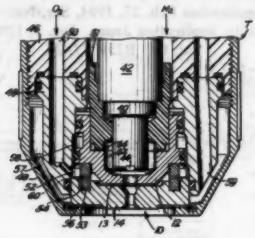
forming a high pressure arc plasma between the nonconsummable electrode and the workpiece;

constricting said arc through said first arc constricting passageway;

further constricting said arc through said second arc constricting passageway with said second arc constricting passageway spaced apart from said first arc constricting passageway to form a narrow gap which is between 0.005 and 0.030 inch in dimension;

introducing a stream of only nitrogen gas having a swirl flow pattern around said electrode and through said first and second arc constricting passageways;

introducing a stream of an oxygen containing reactive gas only into said gap and in a swirl flow pattern such that said gas passes through said second arc constricting passage-



way and aspirates into said nitrogen stream with substantially no backflow through the first arc constricting passageway;

adjusting the flow of nitrogen gas relative to the flow rate of said oxygen containing reactive gas to alter the concentration of oxygen in said arc plasma to a total concentration of at least about 40% oxygen by volume.

4,521,667

METHOD FOR THE MANUFACTURE OF A DEVICE FOR THE READ-OUT OF A TWO-DIMENSIONAL IMAGE PATTERN WITH AN ARRAY

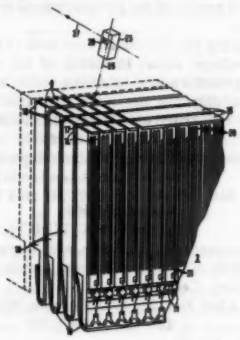
Bertram Sachs, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,479

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 3300831

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LJ **3 Claims**



1. Method for the manufacturing of a device for reading-out a two-dimensional charge image with an array comprising stacked printed circuit boards, each of which is provided on one of its large faces with switch-selected amplifiers to each of which a leak resistance is assigned, and each of which is provided on one of its narrow faces and on a portion of the adjacent large face that is equipped with leak resistances with a thin film of electrically conductive material, comprising the steps of: conducting a laser beam over said narrow sides of said stacked printed circuit boards to divide said thin film on said narrow sides and said large faces into individual electrodes.

4,521,668

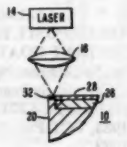
METHOD OF HERMETICALLY LASER SEALING ELECTRONIC PACKAGES

Thaddeus A. Osial, Randallstown; Alexander A. Bosna, Arnold, and Richard J. Kulak, Ellicott City, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 8, 1983, Ser. No. 549,860

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LC **3 Claims**



1. Method of fabricating a hermetically sealed r.f. electronic module comprising a generally box-like package containing r.f. circuitry therein, which package includes side wall portions and top and bottom cover members, with hermetic electrical connectors sealed through the side walls, and r.f. electrical circuit means are disposed within the package, and wherein at least one of the top or bottom cover members is removably connectable to the package with fastener means, which method comprises:

(a) forming a recessed cover member seating portion extending peripherally about one side wall end portion;

(b) mounting the top cover member on the recessed cover member seating portion, and removably fastening said top cover member thereto;

(c) disposing a sealable thin weldable cover sheet over the top cover member, with the cover sheet perimeter portions seating on the side wall end portion perimeter portions.

(d) laser welding the cover sheet perimeter portion to the side wall end portion perimeter portion to hermetically seal the module.

4,521,669

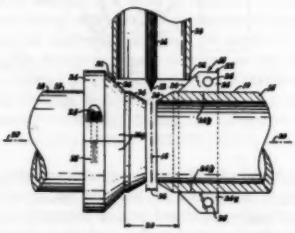
TUBE-WELDING AUXILIARY

Michael R. Porter, R.R. 2, Box 282A, Terre Haute, Ind. 47802, and Ross W. Elliott, R.R. 17, Box 316, Brazil, Ind. 47834

Filed Mar. 9, 1983, Ser. No. 473,528

Int. Cl.³ B23K *9/28*

U.S. Cl. 219—125.11 **4 Claims**



1. A gas tungsten arc welding auxiliary, for use with an electrode having a body portion and an operating point, for supportingly guiding the operating point of the associated electrode of an assembly of electrode, tig torch, and cup, such that the operating point of the electrode is guided over and along a circular work-path of a tube means to be welded by a weld achieved by the operative function of the electrode, tig

torch, filler wire, and tube means as a work object, as the tube means and the assembly are relatively rotated about the axis of the tube means, comprising:

a guide body means;

securing means for securing the guide body means to the associated tube means;

the guide body means providing a circular supporting path concentric with the axis of the tube means but spaced axially from the work-path of the weld;

the circular supporting path thereby providing a template-type guide for the operating point of the electrode as the cup is held against the supporting path during relative rotation of the assembly and the tube means, guiding the operating point of the electrode with respect to the tube means and to the work-path thereof, as the said relative rotation causes the relative movement of the assembly and tube means;

in a combination in which the guide body means, and the securing means for securing the guide body means to the associated tube means, comprise a pair of collar members each having a pair of semi-circular open ring bodies whose inner edges seat onto the outer wall of the respective tube-portion, and the two semi-circular ring bodies of each collar member are provided with securing means for securing each respective pair together and securely gripping the respective tube-portion at a selected axial setting to establish the desired weld work-path even though the outer wall of both of the tube-portions is cylindrical and without any axial locator means;

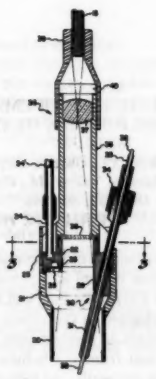
in a combination in which the collar members have a conical surface whose axis is concentric with the axis of the tube means, and provide both a guide of the cup and electrode axially of the associated tube means but also to provide a guide for the cup and electrode so as to be at the desired radial distance from the associated tube means.

4,521,670

GAS METAL ARC WELDING TORCH WITH VISION SYSTEM

Allen W. Case, Jr., Amsterdam, and Donald C. Peroutky, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,753
Int. Cl.³ B23K 9/10
U.S. Cl. 219—130.01 **5 Claims**



1. A compact gas metal arc welding torch with an integral vision sensor comprising:

a ring-shaped conductive torch body having internal passages for coolant and cover gas and, near the periphery, electrical power, coolant and cover gas connections;

a housing that encloses and supports said torch body and to which a gas cup is attached;

an integral optical system having an axis that passes through the central region of said torch body and gas cup is comprised of a lens system in a lens housing which is mounted on said torch body, said optical system viewing the workpiece and weld region through the center of said ring-shaped torch body and providing a demagnified image;

means on said torch for transferring said image to a remote control system; and

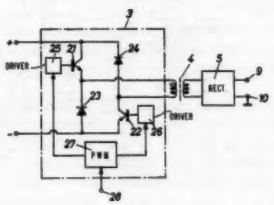
a slim profile filler wire/electrode guide mounted on said ring-shaped torch body and projecting into said gas cup at an angle to the optical axis to minimize obstruction to passage of light from the weld region to said optical system, and sufficiently far removed from the focal plane that said wire guide is minimized in said image.

4,521,671

ELECTRONIC WELDING APPARATUS

Klaus Fronius, Pettenbach, Austria, assignor to Miller Electric Manufacturing Company, Appleton, Wis.

Filed Oct. 17, 1983, Ser. No. 542,617
Claims priority, application Austria, Oct. 21, 1982, 3867/82
Int. Cl.³ B23K 9/10
U.S. Cl. 219—130.31 **2 Claims**



1. In an electronic welding apparatus including a control element for controlling at least one welding parameter, such as welding current or welding voltage, the improvement which is characterised in that said control element is a controlled switching mode power supply, wherein an analog control circuit having an output is provided for controlling said switching mode power supply on its primary, the actual values of the welding current and the welding voltage being fed to said analog control circuit, and wherein said switching mode power supply has an output, and further comprising a current-/voltage converter provided at the output of the switching mode power supply for the actual value of the welding current, the actual value of the welding voltage being taken directly at the output of the switching mode power supply, a microprocessor control, the nominal value of said at least one welding parameter being fed to the analog control circuit of said switching mode power supply via said microprocessor control, an entry keyboard and a display both connected to said microprocessor control, a switching stage provided for said switching mode power supply and containing semiconductors as switching means, a pulse width modulator connected to the output of said analog control circuit, and driver stages, said switching means being controlled by said pulse width modulator via said driver stages; wherein said switching stage is designed as an unsymmetrical half-bridge converter constituted by two switching transistors, further comprising diodes arranged in series and a power line rectifier providing a direct current, said two switching transistors being connected in parallel via said diodes and being fed by said direct current provided by said power line rectifier, a transformer provided for said switching mode power supply and having a primary coil and a secondary coil, and connection points of the two switching transistors with said diodes, said primary coil of said transformer being connected between the respective connec-

tion points of the two switching transistors with said diodes, said two switching transistors being simultaneously switched on and off by said pulse width modulator of said switching mode power supply via said driver stages, and said pulse width modulator having an input connection connected with the output of said analog control circuit, connection terminals being provided at the output of said switching mode power supply, a secondary rectifier between said secondary coil and said connection terminals, and switch means, bridging said secondary rectifier, for selectively effecting a direct connection between said secondary coil and said connection terminals.

4,521,672

ELECTRONIC WELDING APPARATUS

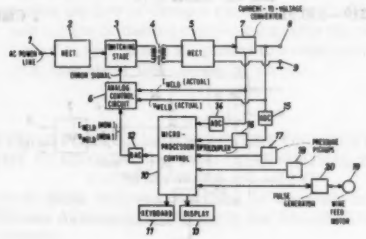
Klaus Fronius, Pettenbach, Austria, assignor to Miller Electric Manufacturing Company, Appleton, Wis.

Filed Oct. 26, 1982, Ser. No. 436,891

Claims priority, application Austria, Oct. 27, 1981, 4565/81; Jun. 14, 1982, 2295/82; Sep. 30, 1982, 3622/82

Int. Cl.³ B23K *9/10*

U.S. Cl. 219—130.33 **10 Claims**



1. In an electronic welding apparatus including a control element for controlling at least one welding parameter, such as welding current or welding voltage, the improvement which is characterized in that said control element is a controlled switching mode power supply, wherein an analog control circuit having an output is provided for controlling said switching mode power supply on its primary, the actual values of the welding current and the welding voltage being fed to said analog control circuit, and wherein said switching mode power supply has an output, and further comprising a current-/voltage converter provided at the output of the switching mode power supply for the actual value of the welding current, the actual value of the welding voltage being taken directly at the output of the switching mode power supply, a microprocessor control, the nominal value of said at least one welding parameter being fed to the analog control circuit of said switching mode power supply via said microprocessor control, an entry keyboard and a display both connected to said microprocessor control, a switching stage provided for said switching mode power supply and containing semiconductors as switching means, a pulse width modulator connected to the output of said analog control circuit, and driver stages, said switching means being controlled by said pulse width modulator via said driver stages; and further comprising analog/digital converters, the actual values of said welding current and said welding voltage being fed to said microprocessor control via said analog/digital converters for forming the product of said actual values, and a digital/analog converter, said product being fed as an actual value to said analog control circuit via said digital/analog converter, and an opto-coupler connected between said microprocessor control and said analog/digital converter for the welding voltage for a galvanic separation.

4,521,673

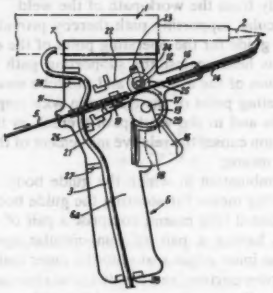
ATTACHMENT FOR SUPPLYING A FILLER WIRE TO AN ELECTRIC SOLDERING IRON OF THE PEN TYPE

Jean-Claude Oury, Villepinte, France, assignor to Societe anonyme dite: Prestinox S.A., Villepinte, France

Filed May 24, 1983, Ser. No. 497,659

Int. Cl.³ H05B *3/02*; B23K *3/06*

U.S. Cl. 219—230 **16 Claims**



1. A device for supplying a filler wire for an electric soldering iron having a cylindrical body with a conductive lead and a heating tip, comprising:

a support butt;

said butt having an upper part;

said upper part including a housing in the form of a V-shaped groove, said groove being defined by two lateral faces of a dihedron and being adapted to receive and support the cylindrical body of a soldering iron;

flexible length-adjustable means on said butt for fixing the body of the iron in said groove; and

means in said support butt for advancing a filler wire and for guiding the wire in the direction of a heating tip on the body of the soldering iron.

4,521,674

ELECTRIC FLUID HEATER EMPLOYING PRESSURIZED HELIUM AS A HEAT TRANSFER MEDIUM

Harry J. Scanlan, 3 Cedar Pl., Garden City, N.Y. 11530, and Leif Liljegren, 550 Ramapo Valley Rd., Oakland, N.J. 07436

Filed Jan. 18, 1982, Ser. No. 339,858

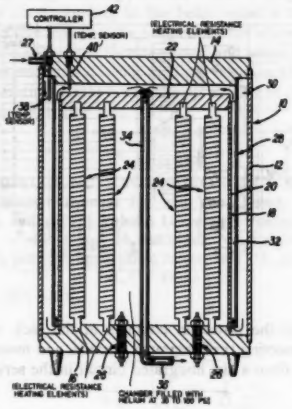
Int. Cl.³ H05B *3/78*; F24H *1/10*; H01C *1/026*

U.S. Cl. 219—299 **7 Claims**

1. A fluid heater comprising a closed metal vessel containing substantially pure gaseous helium at a pressure of from about 30 psi absolute to about 100 psi absolute and at least one electrical resistance heating element in the vessel, the vessel having thermally-conducting walls in contact with the helium in the vessel for transfer of heat from the helium to the walls and thence to a fluid outside the walls, the helium being a medium for rapid transfer of heat from the heating element by conduction and convection to the vessel walls.

2. A heater according to claim 1 wherein the closed helium-containing vessel is received within a container having an inlet for receiving the fluid to be heated from a supply and an outlet

for discharging the fluid spaced-apart from the inlet, whereby the fluid passes adjacent the walls of the vessel in flowing



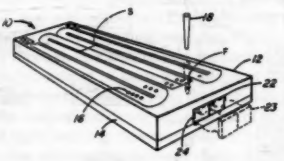
between the inlet and outlet and receives heat from the vessel walls.

4,521,675

CRIBBAGE BOARD

Joseph Yakich, Box 43, Batchawana Bay, Ont., Canada P0S 1A0

Filed Jun. 24, 1983, Ser. No. 507,621
Claims priority, application Canada, Jan. 17, 1983, 419561
Int. Cl.³ A63F *1/18*
U.S. Cl. 235—90 **3 Claims**



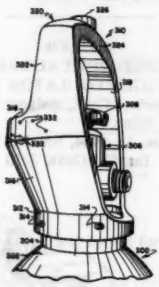
1. A cribbage board comprising:
an elongated board having a plurality of spaced, parallel rows of tally pin receiving sockets in the upper surface thereof, said tally pin receiving sockets being arranged in two sequences, each sequence comprising a first and a second group of sockets;
a skunk line located between said first and second groups of sockets;
an elongated channel in said board;
a pair of elongated sliders located in parallel in said channel, each of said sliders having a plurality of tally pin receiving sockets therein, said plurality of tally pin receiving sockets being in registry with the second group of sockets in the associated sequence on the board, said sliders being movable from an inoperative position and having indicating means thereon visible in the operative position;
means to releasably retain said sliders in the inoperative position;
an additional tally pin receiving socket;
means to cause at least one of said sliders to move from the inoperative to the operative position when a tally pin is inserted into said additional socket and when all the sockets of said second group of sockets associated with said at least one slider are free of tally pins.

4,521,676

ENCODED CAP FOR A PRESSURIZED GAS CYLINDER

Bo Poulsen, Copenhagen, Denmark, assignor to AGA AB, Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 428,633
Int. Cl.³ G06K *17/00*
U.S. Cl. 235—375 **28 Claims**



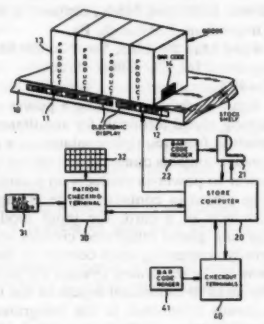
1. A cylinder data encoding device, comprising:
(a) structure non-removably secured to a pressurized gas cylinder for providing a relatively smooth data encoding surface;
(b) the structure also defining surface discontinuity means including an array of surface discontinuities formed in the surface at selected locations thereon to encode cylinder data;
(c) the surface discontinuities including an array of formations that extend substantially perpendicular to adjacent portions of the smooth surface to provide an encoded presentation of cylinder data that can be understood through interpreting the encoded presentation; and,
(d) the surface discontinuities taking the form of a linear array of surface discontinuities arranged in two side-by-side rows including a plurality of columns, with only one surface discontinuity being provided in each of the columns, whereby a surface discontinuity provided in a selected one of the two rows indicates one of two logic states, and a surface discontinuity provided in the other of the rows indicates the opposite logic state.

4,521,677

PRODUCT CONTROL SYSTEM FOR SUPERMARKETS AND THE LIKE

Herbert S. Sarwin, 511 Milburn Ave., Short Hills, N.J. 07078

Filed Dec. 2, 1983, Ser. No. 557,626
Int. Cl.³ G06F *15/24, 15/26*
U.S. Cl. 235—385 **9 Claims**



1. In a product handling system for a vending establishment

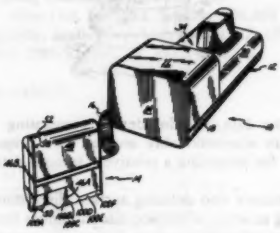
comprising a computer, a checkout terminal linked to said computer, a bar code reader at said checkout terminal for identifying a purchased item, the improvement which comprises a respective electronic display at each of a plurality of shelving rotations for respective items having bar codes, each of said displays being linked to said computer for displaying indicia at least in part assigned to the bar codes of the items stored at the respective shelf sections.

4,521,678

BATTERY-POWERED OPTICAL BAR CODE READER AND VOLTAGE REGULATOR THEREFOR

Arthur J. Winter, Encino, Calif., assignor to Databar Corporation, Eden Praire, Minn.

Filed Jan. 13, 1984, Ser. No. 570,677
Int. Cl.³ G06K *7/10*
U.S. Cl. 235—472 **19 Claims**



1. A battery-powered optical bar code reading system comprising user-actuated power switch means for switching from a first to a second state to initiate operation of the system, a voltage regulator connected to the power switch means for providing a regulated supply voltage from a battery, the voltage regulator being turned on for an initial time interval in response to the power switch means being switched from its said first state to its said second state and remaining turned on thereafter only if a regulator control signal is received, an optical bar code reader powered by the regulated supply voltage for producing an output representative of an optical bar code as relative movement of the reader with respect to the optical bar code occurs, an annunciator for providing a warning in response to an annunciator control signal, and computer means powered by the regulated supply voltage for converting the output of the reader to digital data representative of the optical bar code, the computer means providing said regulator control signal and said annunciator control signal.

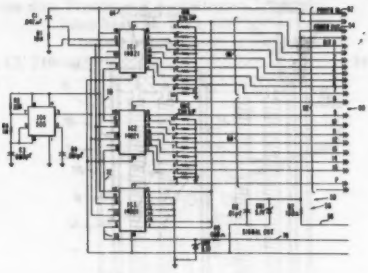
4,521,679

DATA INPUT MODULE

Eric G. Anderson, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 19, 1983, Ser. No. 496,041
Int. Cl.³ G06K *19/06*
U.S. Cl. 235—492 **7 Claims**

1. A data input module comprising a power source, a data input jack having plural terminals for simultaneously reading binary information from multiple contacts on a card, the jack having power-out contacts connected to the power source for providing power to power-in contacts on a card, and the jack further having power-in contacts for receiving power from power-out contacts of a card, the input module apparatus further comprising plural integrated circuits and plural conductors severally connecting each contact in the jack to individual contacts of the integrated circuits for providing binary data from the jacks to individual inputs of the integrated circuits, clock means connected to the integrated circuits for providing clocking pulses to the integrated circuits, and means for connecting the power-in contacts in the jack to each of the integrated circuits and the clock means for powering the integrated circuits and the clock means by power from the power source passed into and out of a key card by the power-out



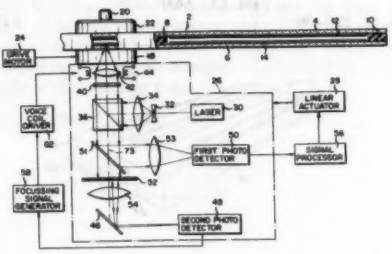
contacts and the power-in contacts in the jack, means for serially connecting the integrated circuits, and means for taking a signal from a last integrated circuit in the series.

4,521,680

SYSTEM FOR FOCUSING A LIGHT BEAM ON A LIGHT REFLECTING SURFACE

Hideo Andō, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 19, 1982, Ser. No. 399,873
Claims priority, application Japan, Jul. 20, 1981, 56-113245; Sep. 17, 1981, 56-146540
Int. Cl.³ G01J *1/36*; G11B *7/00*
U.S. Cl. 250—201 **13 Claims**



10. A system for focusing a light beam on a light reflecting surface, comprising:

an objective lens for converging the light beam, whereby light beam is formed on the light reflecting surface when the objective lens is in the just focusing state, and whereby a beam spot of a larger size than that of the beam waist is formed on the light reflecting surface when the objective lens is in the defocusing state;

a photodetector having a light receiving surface including at least two photosensitive regions and a photoinsensitive region arranged between the two photosensitive regions and detecting no substantial light rays; and

means for transferring a light beam reflected from the light reflecting surface and directing the light beam toward the light receiving surface of the photodetector, whereby the light beam is projected toward at least one of the photosensitive regions when the objective lens is in the defocusing state, wherein

said transfer means includes projection lens means for directing the light beam toward the light receiving surface of the photodetector and means for deflecting the light beam in accordance with the distance between the objective

lens and the light reflecting surface, and the light receiving surface of the photodetector is substantially arranged on an image forming plane on which an image of the beam spot corresponding to the beam waist is formed by the objective lens and the projection lens when the objective lens is in the just focusing state, and wherein

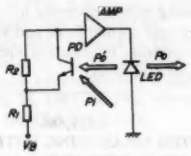
said means for deflecting the light beam includes means for generating a light beam passing parallel to the optical axis of the objective lens.

4,521,681

OPTICAL FUNCTION SEMICONDUCTOR DEVICE

Humio Inaba; Hiromasa Ito, and Yoh Ogawa, all of Sendai, Japan, assignors to Tohoku University, Sendai, Japan

Filed May 24, 1982, Ser. No. 381,842
Claims priority, application Japan, Nov. 25, 1981, 56-187689
Int. Cl.³ G01J *1/32*
U.S. Cl. 250—205 **7 Claims**



1. An optical function semiconductor device comprising:

a light emitting element and an opto-electrical converting element, both of which consist of semiconductors, said light emitting element and said opto-electrical converting element being circularly interconnected optically and electrically;

a controlling semiconductor means for controlling respective input-to-output performances of said light emitting element and said opto-electrical converting element;

the output light of said light emitting element being controlled through said controlling semiconductor means by the electric output of said opto-electrical converting element, said electric output being generated in response to at least the internal incidence of a portion of said output light of said light emitting element; and

whereby the relationship between the incident light on said opto-electrical converting element and said output light of said light emitting element is determined by said respective input-to-output performances controlled through said controlling semiconductor means.

4,521,682

PHOTODETECTING DEVICE HAVING JOSEPHSON JUNCTIONS

Toshiaki Murakami; Yoichi Enomoto, and Takahiro Inamura, all of Mito, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,509
Claims priority, application Japan, May 14, 1983, 58-84845
Int. Cl.³ H01L *39/22*
U.S. Cl. 250—211 J **2 Claims**

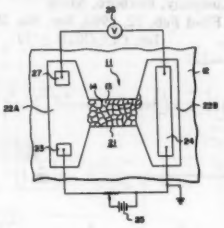
1. A photodetecting device having Josephson junctions, comprising:

an insulating substrate;

a polycrystalline superconductor film formed on said insulating substrate such that Josephson junctions are formed at grain boundaries, said superconductor film having a first region subjected to light illumination, and second and third regions formed contiguously at both sides of said first region such that a width of each of said second and third regions is wider than that of said first region;

means for supplying a predetermined bias current between said second and third regions; and

means for detecting a change in voltage between said second and third regions, one terminal of said means for supplying



and one terminal of said means for detecting being commonly grounded,

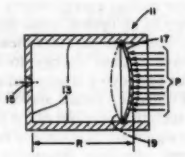
wherein said superconductor film comprises $BaPb_{1-x}Bi_xO_3$ (where $0.32 \leqq \times \leqq 0.35$).

4,521,683

PRESSURE-ACTUATED OPTICAL SWITCH

Glen E. Miller, Redondo, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 20, 1981, Ser. No. 245,719
Int. Cl.³ G01D *5/30*
U.S. Cl. 250—221 **36 Claims**



1. An optical switching element comprising:

(a) a diaphragm of resilient material, said diaphragm having at least one optically reflective surface,

(b) means for supporting said diaphragm for rapid snap-action movement between a spherical concave state and a spherical convex state in response to a condition desired to be sensed,

(c) means for directing a light beam toward said at least one optically reflective surface of said diaphragm, said directing means including a member having an aperture therein through which said light beam passes, said aperture positioned a distance away from said diaphragm equal to the radius of curvature of said diaphragm,

(d) means for receiving said light beam after reflection from said diaphragm,

(e) said diaphragm operative in said concave state to reflect at least a portion of said light beam to said receiving means, and

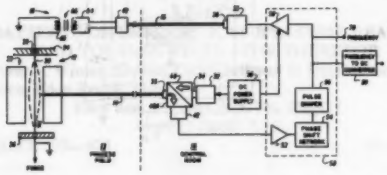
(f) said diaphragm operative in said convex state to reflect said portion of said light beam away from said receiving means,

whereby said diaphragm provides a rapid switching element for abruptly making and breaking a light path formed by said light beam between said light directing and receiving means.

4,521,684
OPTICAL MEASUREMENT SYSTEM WITH LIGHT-DRIVEN VIBRATING SENSOR ELEMENT

Anthony C. Gilby, Foxboro; Edward L. Lewis, Sharon, and Everett O. Olsen, Wrentham, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Feb. 22, 1982, Ser. No. 350,687
Int. Cl.³ G02B 5/14
U.S. Cl. 250—227 9 Claims



1. In an instrumentation system of the type wherein a physical parameter or measurand is to be measured at a sensor site by a sensor having therein an oscillator which includes an electromagnetically driven oscillating resonant element, the resonant frequency of vibration of which is responsive to and related to the measurand, said sensor being located at the measurement site, apparatus for powering oscillation of said sensor and determining said resonant frequency by fiber optic means comprising:

(a) first transducer means located at the sensor site for conversion of radiant energy to electrical energy required for powering the electromagnetically driven oscillating element of the sensor;

(b) radiant energy reflection means associated with the oscillating element for reflecting radiant energy;

(c) variable-power radiant energy source means for powering the oscillating resonant element;

(d) steady power radiant energy source means for providing radiant energy as an optical sense signal;

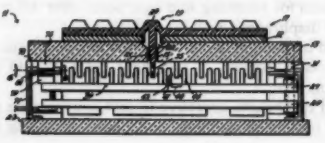
(e) at least one fiber optic pathway means for conveying the variable power radiant energy to the first transducer means and for conveying steady radiant energy to a point adjacent the reflection means associated with the oscillating element such that portions of the steady radiant energy optical sense signal are periodically reflected at said oscillating element vibrating frequency by said reflection means back along said at least one fiber optic pathway means;

(f) radiant energy level control means for regulating the variable-power radiant energy source output energy level over time in response to the reflected optical sense signal received by the radiant energy level control means.

4,521,685
TACTILE SENSOR FOR AN INDUSTRIAL ROBOT OR THE LIKE

Jack Rebman, Cary, N.C., assignor to Lord Corporation, Erie, Pa.

Filed Mar. 1, 1982, Ser. No. 353,435
Int. Cl.³ G01D 5/34
U.S. Cl. 250—229 21 Claims



1. A device for detecting, discriminating and identifying a number of mechanical contact parameters when contacting an object including presence, pressure, pressure pattern, topography, slip, incipient slip and the like comprising:

a touch surface for contacting said object, said touch surface being movable in a horizontal plane;

a plurality of sensitive sites disposed in an array on said touch surface, said sensitive sites being deflected in response to a normal force applied by contact with said object, said touch surface being moved laterally in said horizontal plane in response to a shear force applied by contact with said object;

normal force detection transducer means associated with each of said sensitive sites, said normal force transducer means being operable to sense said deflection of said sensitive sites and produce an electrical signal proportional to the magnitude of said deflection;

shear force detection transducer means associated with said touch surface, said shear force transducer means being operable to sense said lateral motion of said touch surface and produce an electrical signal proportional to said lateral motion;

signal processing means operable to receive said electrical signals from said normal force and shear force transducer means and provide information identifying said contact parameters of said object.

4,521,686
LINEWIDTH MEASURING WITH LINEARITY CALIBRATION OF THE T.V. CAMERA TUBE

Vincent J. Coates, Palo Alto; J. Evan Grund, San Jose, and Stephen B. Westrate, Portola Valley, all of Calif., assignors to Nanometrics Incorporated, Sunnyvale, Calif.

Filed May 24, 1983, Ser. No. 497,515
Int. Cl.³ H01J 3/14
U.S. Cl. 250—237 R 5 Claims

1. In a process employing a television camera tube for the accurate measurement of images projected onto the faceplate of the tube, a method for calibrating the tube output to eliminate the effects of inherent scan non-linearity and magnification variations, said method including the step of:

painting a rectangular grid on the faceplate of the camera tube, said grid including first and second straight parallel fences of known spacing and perpendicular to the direction of the raster scan of said tube, said grid masking the areas between said fences and the arcuate edges of said tube adjacent said fences.

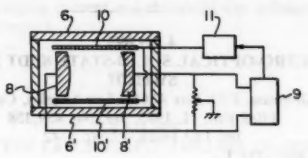
4,521,687
MASS SPECTROMETER

Motohiro Naito, Akishimashi, Japan, assignor to Jeol Ltd., Tokyo, Japan

Filed Jan. 17, 1983, Ser. No. 458,756
Int. Cl.³ B01D 59/44
U.S. Cl. 250—296 6 Claims

1. A mass spectrometer comprising an ion source, means for selecting ions produced and accelerated by said ion source according to their mass to charge ratio, a field-free region in which a part of the massselected parent ions form daughter ions, means for creating superimposed electric and magnetic fields at right angles through which parent and daughter ions

passed through said field-free region pass, means for charging the intensity of said magnetic field from a first level to a second



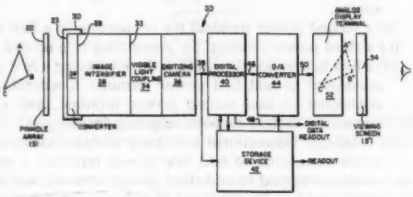
level, and means for sweeping the intensity of said electric field at both magnetic intensity levels.

4,521,688

THREE-DIMENSIONAL AND TOMOGRAPHIC IMAGING DEVICE FOR X-RAY AND GAMMA-RAY EMITTING OBJECTS

Lo I. Yin, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 21, 1983, Ser. No. 459,842
Int. Cl.³ G01T *1/16*
U.S. Cl. 250—363 S **62 Claims**



1. An instrument for obtaining quantitative, three-dimensional and tomographic information relating to x-ray and gamma-ray emitting objects, and for the orthoscopic viewing of such objects, comprising:

means for forming incident x-rays and gamma-rays emitted by an object into an array of substantially nonoverlapping mini-images of said object;

means spatially displaced from said forming means for converting said x-ray and gamma-ray mini-images into visible-light mini-images;

means coupled to said converting means for intensifying said visible-light mini-images;

means to digitize said intensified visible-light mini-images;

computing means for processing said digitized mini-images for tomographic and three-dimensional reconstruction of said object; and

viewing means for direct orthoscopic, three-dimensional viewing of the reconstructed x-ray and gamma-ray emitting object.

4,521,689

MODULAR RADIATION-DETECTING ARRAY

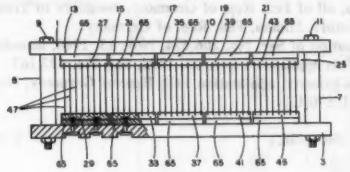
Dennis H. Pritzkow, New Berlin, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Feb. 24, 1983, Ser. No. 469,195
Int. Cl.³ G01T *1/18*
U.S. Cl. 250—385 **22 Claims**

1. A detector array for detecting ionizing radiation comprising:

a plurality of detector modules each having a plurality of detector cells containing a radiation-detecting medium, said detector cells being supported between upper and lower insulating substrates;

a pair of substantially parallel support members in spaced-apart relationship for supporting therebetween said plurality of detector modules;



nut plate means secured to upper and lower insulating substrates of each of said plurality of detector modules; and

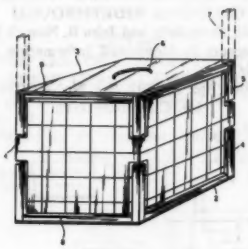
fastening means for rigidly and releasably attaching said detector modules to said pair of support members, such that each of said nut plates is in parallel contiguity with one of said support members.

4,521,690

METHOD OF AND DEVICE FOR IRRADIATING ANIMALS

Charles A. Sondhaus, 105 Jasmine Creek Dr., Corona Del Mar, Calif. 92625, assignor to Charles A. Sondhaus, Jülich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 82,061, Oct. 5, 1979, Pat. No. 4,318,000. This application Jun. 3, 1981, Ser. No. 269,815
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1978, 2844041
The portion of the term of this patent subsequent to Mar. 2, 1999, has been disclaimed.
Int. Cl.³ G01N *21/00*
U.S. Cl. 250—455.1 **12 Claims**

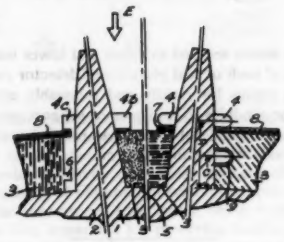


1. A device for the irradiation of animals, especially experimental animals, which comprises a cage for receiving said animals and formed with a ceiling member along the top of said cage, a floor member along the bottom of said cage, an openwork between said members around at least the periphery of said cage, said openwork forming at least side walls of said cage, at least one of said members being formed as a planar irradiator constituting a removable plate formed with radiation sources in the form of radioactive elements distributed over the area of said plate to form a uniform radiation field over the area thereof, and means on said cage for removably holding said plate.

4,521,691
SHIELDING CONTAINER HAVING NEUTRON SHIELDING FOR THE TRANSPORTATION AND/OR STORAGE OF RADIOACTIVE MATERIAL

Richard Christ, Bruchköbel; Erhard Müller, Gründau; Hans-Günther Knackstedt, Langenselbold, and Reiner Laug, Hanau, all of Fed. Rep. of Germany, assignors to Transnuklear GmbH, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 206,674, Nov. 13, 1980, abandoned.
This application Sep. 23, 1982, Ser. No. 422,167
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 7932570[U]
Int. Cl.³ G21C 19/00
U.S. Cl. 250—506.1 6 Claims

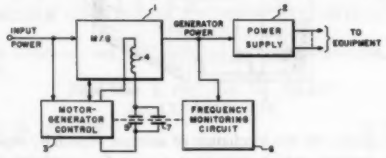


1. A container for radioactive materials which produce gamma and neutron-radiation emissions and residual heat, comprising, in combination, a container body having shielding means for gamma radiation, an exterior surface, a plurality of spaced-apart cooling fins projecting from said exterior surface and connected at one end thereof to said exterior surface of said container body, at least some of said cooling fins having boss means thereon intermediate the ends thereof, neutron shielding means removably disposed on said exterior surface of said container and removably held in place between said cooling fins by said boss means so that, in the event any cooling fin is damaged, said neutron shielding means can be removed to permit access to the portion of said cooling fin between said boss means and said exterior surface of said body.

4,521,692
MOTOR GENERATOR SHUTDOWN CIRCUIT FOR EXTENDED RIDETHROUGH

Luther L. Genuit, Scottsdale, and John R. Nowell, Phoenix, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 8, 1982, Ser. No. 366,739
Int. Cl.³ H02H 3/46
U.S. Cl. 290—4 A 3 Claims

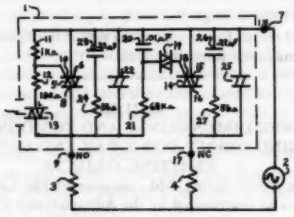


1. A ridethrough power generating system comprising:
(a) motor-generator means, having an input terminal adapted to receive input power, for generating output power;
(b) at least one power supply means for generating at least one form of converted power from said output power;
(c) a motor-generator control means, operatively connected to said input terminal, for providing control of said output power; and
(d) means for monitoring the frequency of said output power to operate in conjunction with said motor-generator control means thereby providing at least one additional control function of said output power.

4,521,693
ELECTRO-OPTICAL SOLID-STATE SPDT RELAY SWITCH

Alan L. Johnson, P.O. Box 45443, Los Angeles, Calif. 90045

Filed Feb. 11, 1983, Ser. No. 439,358
Int. Cl.³ H03K 17/60, 3/42
U.S. Cl. 307—252 T 4 Claims

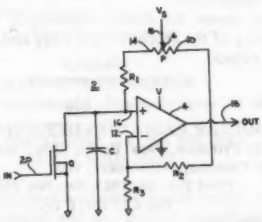


1. An electrical a.c. power-switching relay circuit comprising,
(a) a first power terminal for connecting to an a.c. power source,
(b) a second power terminal for connecting to a first load,
(c) a third power terminal for connecting to a second load,
(d) a first bidirectional switching device having a first anode connected to said first power terminal, a second anode connected to said second power terminal, and a gate connected to light-responsive gating means, and
(e) a second bidirectional switching device having a first anode connected to said first power terminal, a second anode connected to said third power terminal, and a gate connected to a first terminal of voltage-responsive gating means having a second and third terminal connected to the first and second anode, respectively, of said first bidirectional switching device, wherein said voltage-responsive gating means is responsive to the level of voltage present between the first anode and the second anode of said first bidirectional switching device.

4,521,694
COMPARATOR TIMER WITH DUAL FUNCTION ADJUSTMENT

Lawrence J. Ryczek, Nashotah, and William J. Janutka, West Allis, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 30, 1983, Ser. No. 509,952
Int. Cl.³ H03K 5/159
U.S. Cl. 307—266 18 Claims



1. A timer comprising in combination comparator means having a comparing input terminal connected to an RC charging current circuit, and a reference threshold input terminal,

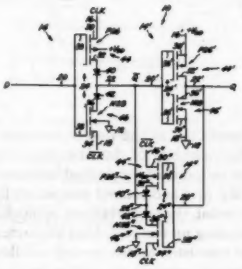
and comparing voltage at said comparing input terminal due to said charging current against threshold trip voltage at said reference terminal, and single means for concurrently changing both charging current and threshold trip voltage for said comparator means.

4,521,695

CMOS D-TYPE LATCH EMPLOYING SIX TRANSISTORS AND FOUR DIODES

Moshe Mazin, and William E. Engeler, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 23, 1983, Ser. No. 478,014
Int. Cl.³ H03K *3/356, 19/096, 23/22;* **G11C** *19/28*
U.S. Cl. 307—279 **5 Claims**



1. A D-type latch having a data input node, a data output node, and a complementary data output node, said latch comprising:

first, second and third inverters each having an input node, an output node, and a pair of inverter voltage supply nodes, each of said first and third inverters capable of being selectively enabled by applying voltage polarity of one sense to its voltage supply nodes and of being selectively disabled by applying voltage polarity of the opposite sense to its voltage supply nodes, the output node of either of said first and third inverters being essentially an open circuit with respect to either logic voltage level when the particular inverter is disabled;

said second inverter voltage supply nodes comprising said latch voltage supply nodes for continuously enabling said second inverter;

said first and third inverter voltage supply nodes comprising complementary clock input nodes such that, when said clock input nodes have applied thereto one set of complementary logic voltage levels for enabling said latch, said first inverter is enabled and said third is disabled, and when said clock input nodes have applied thereto a complementary set of logic voltage levels for not enabling said latch, said first inverter is disabled and said third inverter is enabled;

said first inverter input node comprising said latch data input node;

said first inverter output node comprising said latch complementary data output node and being connected to said second inverter input node;

said second inverter output node comprising said latch data output node; and

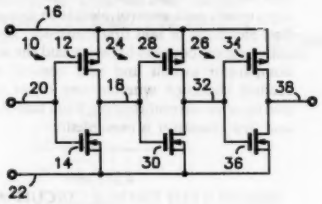
said third inverter being cross-coupled with said second inverter in a latching configuration, said third inverter input node being connected to said second inverter output node and said second inverter input node being connected to said third inverter output node.

4,521,696

VOLTAGE DETECTING CIRCUIT

Kuppuswamy Raghunathan, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 6, 1982, Ser. No. 395,424
Int. Cl.³ H03K *5/153, 5/24*
U.S. Cl. 307—350 **3 Claims**



1. In a integrated circuit adapted to receive operating power via first and second supply voltage nodes, a voltage detecting circuit for providing an output signal when an input signal applied to an input node of the integrated circuit exceeds the voltage on the second supply voltage node, comprising:

a first field effect transistor having a source region of a first conductivity type coupled to the first supply voltage node, a drain region of the first conductivity type coupled to an output node, a current channel region of a second conductivity type between the source and drain regions and coupled to the first supply voltage node, and a gate electrode adjacent to but insulated from the current channel region and coupled to the second voltage node; and

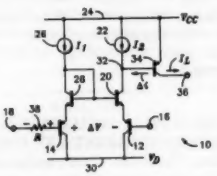
a second field effect transistor having a source region of the second conductivity type coupled to the input node, a drain region of the second conductivity type coupled to the output node, a current channel region of the first conductivity type between the source and source and drain regions and coupled to the input node, and a gate electrode adjacent to but insulated from the current channel region and coupled to the second supply voltage node, the on resistance of the second transistor being smaller than the on resistance of the first transistor to provide a voltage swing on the output node substantially between the voltage on the first supply voltage node and a voltage between the voltage on the second supply voltage node and the voltage on the input node.

4,521,697

PNP COMPARATOR CIRCUIT HAVING BETA CURRENT ERROR CANCELLATION

Eric D. Joseph, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1982, Ser. No. 453,389
Int. Cl.³ H03K *5/153, 5/24, 17/72*
U.S. Cl. 307—355 **8 Claims**



1. A comparator circuit having first and second inputs and an output, comprising:

first and second conductors;

first and second transistors of a first conductivity type each having first and second electrodes and a control electrode;

said first electrodes being coupled to said first conductor, said second electrodes being coupled to said second conductor, said control electrodes being coupled respectively to the first and second inputs of the comparator;

a third transistor of said first conductivity type having first and second electrodes and a control electrode, said first electrode being coupled to said first conductor, said second electrode being coupled to the output of the comparator circuit, said control electrode being coupled to said first electrode of said first transistor; and

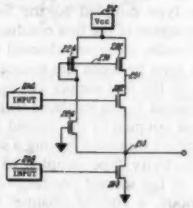
resistive means coupled between said the second input of the comparator circuit and said control electrode of said second transistor wherein any offset voltage produced due to error current flowing from said third transistor into said first transistor is cancelled.

4,521,698

MOS OUTPUT DRIVER CIRCUIT AVOIDING HOT-ELECTRON EFFECTS

Ronald T. Taylor, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Dec. 2, 1982, Ser. No. 446,105
Int. Cl.³ H03K *19/003, 17/14, 17/693*
U.S. Cl. 307—450 **3 Claims**



1. An integrated-circuit output circuit for combining logic output signals from first and second logic input terminals to control the voltage on an output node, comprising:

a first output transistor having a first terminal connected to ground, a second terminal connected to said output node and a gate connected to said first logic input terminal; and

a second output transistor having a first terminal connected to said output node, a second terminal connected to a power supply node and a gate connected to said second logic input terminal; characterized in that:

a third output transistor having a gate, said third output transistor being connected between said second terminal of said second output transistor and said power supply node, and further characterized in that compensating means coupled to said output node and substantially responsive only to negative voltage on said output node for controlling said third output transistor controls said gate of said third output transistor to switch the transconductance of said third output transistor between a first transconductance when said voltage on said output node is greater than or equal to ground and a second transconductance when said voltage on said output node is less than ground.

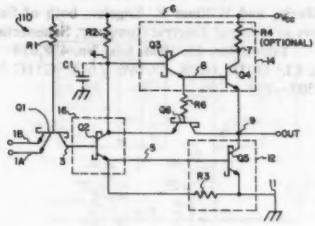
4,521,699

HIGH-SPEED SCHOTTKY TTL GATE APPARATUS

Stanley Wilson, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 10, 1982, Ser. No. 416,450
Int. Cl.³ H03K *19/013, 19/088, 19/092, 17/04*
U.S. Cl. 307—456 **2 Claims**

1. A transistor logic circuit having an input terminal and an output terminal, including a phase splitter transistor, a pulldown circuit, and a pullup circuit; the phase splitter transistor having a base terminal coupled to the input terminal of the logic circuit, an emitter terminal coupled to a reference potential, and a collector terminal coupled to a source of potential, the pulldown circuit being coupled between the output terminal of the logic circuit and the reference potential, the pulldown circuit having an input connected to the emitter terminal of the phase splitter transistor; the pullup circuit including first and second transistor, each having emitter, base, and collector terminals and forming a Darlington output stage, the bse of the first transistor being connected to the collector terminal of the phase splitter transistor, the emitter terminal of the second



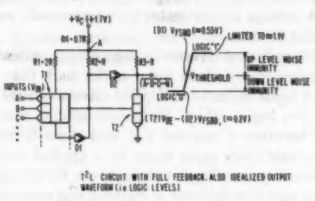
transistor beig connected to the output terminal of the logic circuit, the emitter terminal of the first transistor being connected to the base terminal of the second transistor, the collector terminals of the first and second transistors being coupled to a source of potential, the improvement comprising: a transistor means for speeding up the switching characteristics of said logic circuit, said transistor means having a collector terminal coupled to said output terminal, an emitter terminal coupled to the collector terminal of said phase splitter transistor, and a base terminal coupled to base terminal of the second transistor of said pullup circuit.

4,521,700

TTL LOGIC CIRCUIT EMPLOYING FEEDBACK TO IMPROVED THE SPEED-POWER CURVE

Richard J. Blumberg, Poughkeepsie; Stewart Brenner, Wappingers Falls, and Rocco J. Robortaccio, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,541
Int. Cl.³ H03K *19/003, 19/088*
U.S. Cl. 307—456 **9 Claims**



T^2L CIRCUIT WITH FULL FEEDBACK, ALSO IDEALIZED OUTPUT WAVEFORM (i.e LOGIC LEVELS)

1. An improved T^2L circuit employing partial feedback and having enhanced operating characteristics, said improved T^2L circuit comprising:

a first transistor having a collector, base, and at least first, second, and third emitters, said first, second, and third emitters of said first transistor respectively receiving a logical binary input A, B, and C;

a second transistor having an emitter, base, and collector, said emitter of said second transistor being connected to a first potential source, said base of said second transistor being connected to said collector of said first transistor;

a first resistor connected between said base of said first transistor and a second potential source;

second and third resistors serially connected between said base of said second transistor and said collector of said second transistor;

a fourth resistor connected between the junction of said second and third resistors and said second potential source; and

an output terminal connected to said collector of said second transistor, said output terminal manifesting the logical binary function A·B·C.

4,521,701

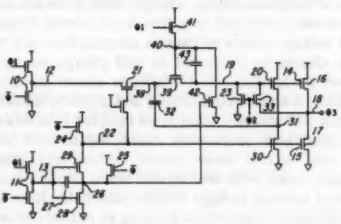
HIGH-SPEED LOW-POWER DELAYED CLOCK GENERATOR

Chitranjan N. Reddy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 16, 1982, Ser. No. 419,118

Int. Cl.³ H03K *17/04, 17/687*

U.S. Cl. 307—482 **10 Claims**



1. A clock generator circuit for providing a high-level output clock voltage signal at an output node after a delay following an input clock voltage signal applied to an input node, comprising:

an input transistor, a transfer transistor, a grounding transistor, a control transistor, a driver transistor, and a hold-down transistor, each of the transistors having a source-drain path and a gate;

the source-drain path of the input transistor being connected between the input node and a holding node, and means precharging the gate of the input transistor prior to said clock input voltage signal;

the source-drain path of the transfer transistor being connected between the holding node and a drive node, the gate of the transfer transistor being connected to a control node;

the source-drain path of the control transistor connecting the control node to a supply voltage, the gate of the control transistor being connected to receive the clock input voltage signal;

the source-drain path of the grounding transistor connecting the control node to ground, the gate of the grounding transistor receiving a precharge signal prior to the clock input voltage signal;

the source-drain path of the driver transistor connecting the output node to the supply voltage, the gate of the driver transistor being connected to the drive node;

the source-drain path of the hold-down transistor connecting the output node to ground, the gate of the hold-down transistor receiving a precharge signal prior to said clock input voltage;

and delay means connected to pull down the gates of the hold-down transistor and the grounding transistor after a time delay following occurrence of said input clock voltage signal; and

capacitive means coupling the output node to the holding node to bootstrap the voltage on the holding node when the output node voltage rises.

4,521,702

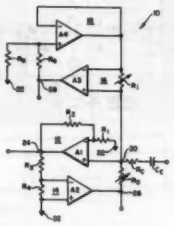
REACTANCELESS SYNTHESIZED IMPEDANCE BANDPASS AMPLIFIER

Leonard L. Kleinberg, Greenbelt, Md., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 13, 1982, Ser. No. 434,085

Int. Cl.³ H03F *3/34;* **H03G** *9/20;* **H03H** *11/04*

U.S. Cl. 307—520 **11 Claims**



1. An active filter network, comprising:

a pair of active circuits (**12–14, 16–18**) each having first (**A1, A3**) and second (**A2, A4**) operational amplifiers coupled together to provide multiple feedback loops therein;

means (**20**) for applying an input signal directly to a non-inverting input port of each of said first operational amplifiers in each of said pair of circuits;

first resistive means (R_1, R_2) included within a first of said feedback loops for attenuating the amplitude of signals between an output port and inverting input port of said first operational amplifiers (**A1**) in a first of said pair of circuits (**12–14**);

second resistive means (R_3, R_4, R_0) included within said first of said feedback loops in conjunction with said second operational amplifier (**A2**) in said first of said pair of circuits (**12–14**) for attenuating and inverting the amplitude of signals between said output port and non-inverting input port of said first operational amplifier in said first of said pair of circuits; and

third resistive means (R_i, R_5, R_6) included within a second of said feedback loops in conjunction with said second operational amplifier (**A4**) in a second of said pair of circuits (**16–18**) coupled in a voltage follower configuration for attenuating the amplitude of signals between the output port and said non-inverting input port of said first operational amplifier in said first of said pair of circuits;

wherein said resistive means are of a magnitude to tune each of said circuits to operate in the gain versus frequency roll-off region of said second operational amplifier (**A2**) in said first of said pair of circuits (**12–14**) and said first operational amplifier (**A3**) in said second of said pair of circuits (**16–18**), thereby providing an equivalent inductive reactance by said first of said pair of circuits and an equivalent capacitive reactance by said second of said pair of circuits to said input signal at frequencies in said roll-off region.

4,521,703

HIGH SPEED SENSE AMPLIFIER

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 30, 1982, Ser. No. 412,807

Int. Cl.³ H03K *5/24, 3/353*

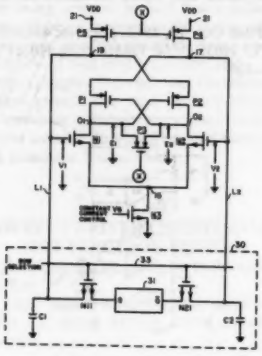
U.S. Cl. 307—530 **10 Claims**

1. In combination with a differential stage having first and second inputs adapted to receive complementary input signals and having first and second differential outputs, the improvement comprising:

first and second transistors, each transistor having first and

second electrodes defining the ends of a conduction path and a control electrode;

means connecting the conduction path of said first transistor between said first input and said second differential output;



means connecting the conduction path of said second transistor between said second input and said first differential output;

means connecting the control electrode of said first transistor to said first differential output; and

means connecting the control electrode of said second transistor to said second differential output.

4,521,704

DIFFERENTIAL AMPLIFYING CIRCUIT

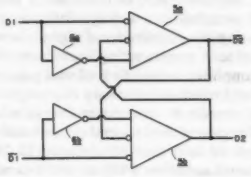
Hirofumi Shinohara; Osamu Tomisawa; Kenji Anami, and Masahiko Yoshimoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1983, Ser. No. 462,204

Claims priority, application Japan, Feb. 13, 1982, 57-23127

Int. Cl.³ H03F *3/45;* H03K *5/02*

U.S. Cl. 307—530 **6 Claims**



1. A differntial amplifying circuit including a pair of main amplifying circuits each having at least three input terminals and at least one output terminal, and a pair of auxiliary amplifying circuits each having at least one amplifying input terminal and at least one output terminal, characterzed in that complementary inputs are connected respectively to the amplifying input terminals of said pair of auxiliary amplifying circuits, the outputs of the main amplifying circuits are connected respectively as crossing feedback inputs to at least another pair of amplifying input terminals of said pair of main amplifying circuits, the complementary inputs are also connected respectively to another at least one pair of amplifying input terminals of said pair of main amplifying circuits, and the output terminals of said auxiliary amplifying circuits are connected to a further at least one pair of amplifying input terminals of said main amplifying circuits.

4,521,705

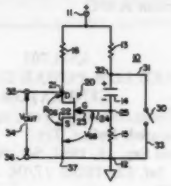
RELIABLE FIELD-EFFECT TRANSISTOR TIMER CIRCUIT

James I. Bartels, Hudson, Wis., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 20, 1983, Ser. No. 515,408

Int. Cl.³ H03K *17/284, 17/687*

U.S. Cl. 307—605 **9 Claims**



1. A reliable timer circuit for connection to a source of direct current voltage, including: charge storage means and impedance means connected in a first series circuit to said direct current voltage source to cause a current flow and to in turn cause a charge to be stored in said charge storage means; depletion mode field-effect transistor means having a drain connection, a source connection, and a gate connection with said drain and source connections coupled in a second series circuit; said gate connection connected to said impedance means; said second series circuit further including second impedance means with said second series circuit connected to said direct current voltage source; said field-effect transistor drain and source connections forming an output circuit for said timer circuit; and switch means including connection means connected to said charge storage means with said switch means being conductive to discharge said charge storage means to bias said field-effect transistor means to a non-conductive state for a fixed interval of time; said non-conductive state of said field-effect transistor means providing said output circuit with an output voltage for said fixed interval of time.

4,521,706

TAPE DRIVING CAPSTAN POWERED WITH A PERMANENT MAGNET MOTOR

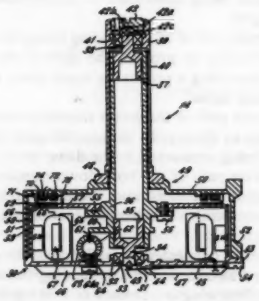
Stefan Kudelski, Chemin de la Croix, and Ernest Rosselet, Assens, both of Switzerland, assignors to Ampex Corp., Redwood City, Calif.

Filed Sep. 15, 1983, Ser. No. 533,095

Claims priority, application United Kingdom, Sep. 17, 1982, 8226572

Int. Cl.³ H02K *7/00*

U.S. Cl. 310—67 R **8 Claims**



1. A capstan for use in a tape transport, comprising:

a base;

a rotatable assembly disposed upright with respect to the base, the rotatable assembly including a cylindrical tape engaging portion and a rotor portion, the said rotor portion being between the cylindrical tape-engaging portion and the base and being of dish-shaped form facing the base, a plurality of magnets being carried at angularly spaced intervals around the inside of the rotor;

a stator winding extending around the base in proximity to said magnets and within said rotor;

a magnetic tachometer mounted above said rotor with respect to the base, the tachometer comprising;

a first magnetically permeable toothed ring carried on said rotatable assembly and coaxial therewith;

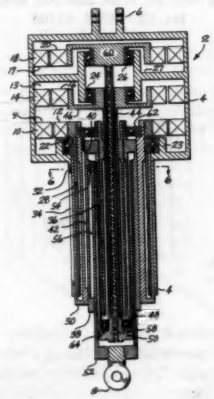
a second magnetically permeable toothed ring fixedly mounted relative to the base and in axial register with said first ring, said rings partly defining a magnetic circuit with a flux path extending axially in the region of the teeth, radially of said rings and axially of said rings in a region radially spaced from said teeth, a ring magnet coaxial with said rings for producing flux in said flux path and a sensing coil coaxial with said rings and disposed to link with the flux path.

4,521,707

TRIPLE REDUNDANT ELECTROMECHANICAL LINEAR ACTUATOR AND METHOD

Irwin G. Baker, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 12, 1983, Ser. No. 560,971
Int. Cl.³ H02K 7/06
U.S. Cl. 310—80 **16 Claims**



1. A linear actuator comprising:

a housing;

a plurality of extendible/retractable coaxial stages positioned telescopically with respect to the housing and each other;

a like number of electric motors, each of which has a stator portion attached to the housing, and a rotor portion;

drive transmission means interconnecting each rotor portion and a different one of the stages for converting rotational motion of the rotor portion into linear axial motion of the stage; and

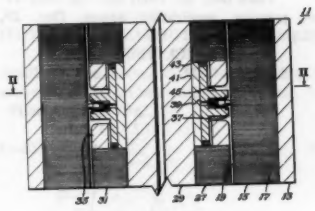
mechanical connection means for mechanically interconnecting the stages with each other to cause each stage, when it moves in a linear axial direction, to carry with it any other stages positioned with respect to it in a given radial direction so that the linear axial displacements of the stages are mechanically summed.

4,521,708

MOTOR BEARING WITH LOCKING PINS

Joseph E. Vandevier, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Mar. 15, 1984, Ser. No. 589,810
Int. Cl.³ H02K 5/16
U.S. Cl. 310—87 **4 Claims**



1. An elongated electric motor for a submersible pump, comprising in combination:

a housing filled with lubricating fluid;

a stator mounted in the housing and having an inner wall;

a rotatable shaft mounted within the stator;

a rotor composed of spaced-apart rotor sections mounted on the shaft;

a bearing mounted between each of the rotor sections, having an inner diameter and an outer periphery; and

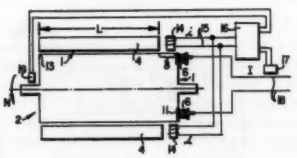
at least one locking element carried by each of the bearings, each locking element being reciprocally located in a passage extending from the inner diameter to the periphery of the bearing, the passage being in communication with hydraulic presure in the inner diameter of the bearing created by rotation of the shaft, the hydraulic pressure urging the locking element outward into engagement with the inner wall of the stator to prevent rotation of the bearing.

4,521,709

DIRECT CURRENT DYNAMOELECTRIC MACHINES WITH AUXILIARY EQUALIZER POLES

Jacques A. Saint-Michel, Maubeuge; Jean-Pierre Chabrerie, Gif, and Alain Mailfert, Bouxieres Aux Dames, all of France, assignors to Etat Francais, Paris Armees, France

Filed Sep. 8, 1982, Ser. No. 415,994
Claims priority, application France, Sep. 10, 1981, 81 17129
Int. Cl.³ H02K 23/22
U.S. Cl. 310—186 **11 Claims**



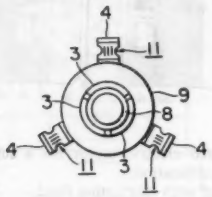
1. A direct current electrodynamic machine comprising a stator and a rotor, said stator containing a ferromagnetic frame defining an internal cylindrical housing for said rotor, at least one field winding, at least one field pole with a radially symmetric axis, said rotor containing a plurality of armature conductors linked at one end of said rotor to a collector ring device, said ring device cooperating with at least one sliding contact arranged on said stator near said field pole, said field pole having at one axial end at least one auxiliary pole arranged in the same radially symmetric plane and at substantially the same radius as said field pole, said auxiliary pole being supplied

a current regulated by at least one operating current of said machine.

4,521,710
COMMUTATOR DEVICE FOR MINIATURE MOTORS

Takaichi Mabuchi, Matsudo, Japan, assignor to Mabuchi Motor Co. Ltd., Japan

Filed Dec. 29, 1983, Ser. No. 566,717
Claims priority, application Japan, Dec. 29, 1982, 57-197780[U]
Int. Cl.³ H02K *13/04*
U.S. Cl. 310—234 6 Claims

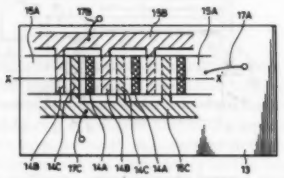


1. A commutator device for miniature motors comprising commutator segments having arc-shaped commutator parts and terminal parts standing upright from said commutator parts; said commutator segments being mounted on an insulating cylinder and said terminal parts being bent to hold lead wires of armature windings, said terminal parts having another portion and a neck portion having a smaller transverse cross-sectional area than the transverse cross-sectional area of said another portion of said terminal part, and means for easily bonding said lead wire is provided on said neck portion to permit said terminal part to be bent at said neck portion to hold said lead wire and to allow said terminal part and said lead wire to be fused together with resistance welding, comprising linear ridges extending in the longitudinal direction of said terminal part.

4,521,711
UNIDIRECTIONAL TRANSDUCER FOR A SURFACE-ACOUSTIC-WAVE DEVICE AND A METHOD OF MAKING SAME

Takeshi Okamoto, and Shoichi Minagawa, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,755
Claims priority, application Japan, Apr. 14, 1982, 57-62001; Apr. 14, 1982, 57-62002
Int. Cl.³ H03H *9/25*
U.S. Cl. 310—313 B 8 Claims

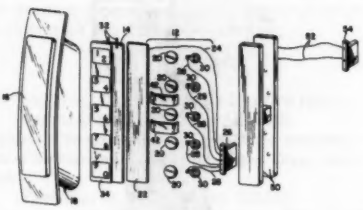


1. A unidirectional transducer for a surface-acoustic-wave device, comprising: a substrate having a surface thereon; a plurality of first electrodes provided on said surface of said substrate at locations which are spaced from each other in a direction by a first predetermined distance; a plurality of second electrodes provided on said surface of said substrate, each said second electrode being spaced in said direction from a respective said first electrode by a second predetermined distance which is substantially one-third of said first predetermined distance; a plurality of third electrodes provided on said surface of said substrate, each said third electrode being spaced in said direction from a respective said second electrode by said second predetermined distance; first and second lead electrodes provided on said surface of said substrate, said first lead electrode being electrically connected to each of said first electrodes and said second lead electrode being electrically connected to each of said second electrodes; a layer of piezoelectric material provided on said surface of said substrate and covering each of said first and second electrodes, said piezoelectric layer having means defining a window therethrough in the region of each said third electrode; and a third lead electrode provided on said piezoelectric layer, said third lead electrode being electrically connected to each said third electrode through the associated window in said piezoelectric layer.

4,521,712
PRESSURE SENSITIVE PIEZOELECTRIC SIGNAL GENERATOR ASSEMBLY

Derrek E. Braun, Royal Oak; Daniel T. Lau, Westland, and Harold Moy, Mt. Clemens, all of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Nov. 25, 1983, Ser. No. 555,268
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—339 11 Claims



1. A signal generator assembly comprising:

a piezoelectric subassembly, including a substantially planar, rigid yet manually flexible, substrate member, one or more discrete piezoelectric elements affixed to said substrate member and respective electrical conducting means connected to opposite sides of each said piezoelectric element for developing a signal voltage therebetween in response to deformation of the respective piezoelectric element by an applied force;

a flexible electroluminescent panel;

a plastic housing having a cavity and including a transparent, rigid yet manually flexible, cover element, said cover element being an integral portion of said housing;

said piezoelectric subassembly and said electroluminescent panel being positioned in said housing cavity in mutual force-transmitting relation with said cover element, said electroluminescent panel being interposed between said cover element and said piezoelectric subassembly; and

means disposed in said housing cavity for maintaining said cover element and said piezoelectric subassembly in sealed, force-transmitting relation with said cover element.

4,521,713
SILICON TARGET SUPPORT ASSEMBLY FOR AN IMAGE SENSING DEVICE

Gilbert N. Butterwick, Leola, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 27, 1983, Ser. No. 461,585
Int. Cl.³ H01J *31/26, 31/38*
U.S. Cl. 313—378 3 Claims

1. In an image sensing device including a wafer of a semiconductor material having a first surface and a second surface, said first surface having a central portion comprising a membrane, said membrane being surrounded by a rim, said membrane being of lesser thickness than said rim, said second surface having at least one charge storage region, and support assembly means to hold said wafer within said device, the improvement wherein said support assembly means comprises:

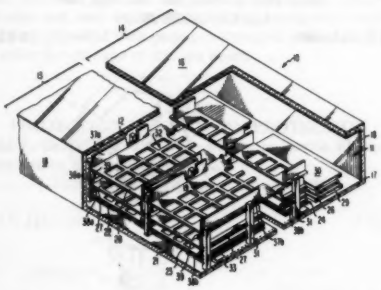
target retainer means including a lower support member in contact with said rim portion of said second surface of said wafer near the periphery thereof, an upper tensioning member having a target contact portion which forcibly abuts said rim portion of said first surface of said wafer between said membrane and the periphery thereof thereby tensioning said membrane; and

means for centering and securing said target retainer means within said device.

4,521,714
SHIELDED ELECTRON BEAM GUIDE ASSEMBLY FOR FLAT PANEL DISPLAY DEVICES

Frank E. Vaccaro, East Brunswick, and John Kowalik, Trenton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 6, 1982, Ser. No. 447,141
Int. Cl.³ H01J *29/74, 19/40*
U.S. Cl. 313—422 18 Claims



1. An electron beam guide assembly for a flat panel display device having a plurality of electron beam propagation channels and a screen for producing a visual image when struck by electrons ejected from said channels, said beam guide assembly comprising:

a pair of parallel spaced electron beam guide meshes, said meshes including at least one column of apertures for propagating electron beams longitudinally along said channels between said beam guide meshes, and at least one additional mesh arranged parallel to and spaced from said beam guide meshes between said guide meshes and said screen;

a plurality of support members spanning the space between said beam guide meshes and said additional mesh and fixedly engaging the edges of said meshes to retain the parallel relationship of said meshes; and

first shield means arranged between said beam guide meshes and said screen, said shield means being fixedly held by said support members at positions displaced along both sides of said column of apertures.

4,521,715
PHOTOEMISSIVE CATHODE FORMED ON CONDUCTIVE STRIPS

Richard D. Faulkner, and Arthur F. McDonie, both of Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 30, 1982, Ser. No. 412,901
Int. Cl.³ H01J *40/06*
U.S. Cl. 313—531 5 Claims

1. In an electron tube having an evacuated envelope including a transparent faceplate with an interior surface with a photoemissive cathode thereon, said cathode comprising a plurality of discrete, substantially isolated photoemissive regions, wherein the improvement comprises

a plurality of spaced apart conductive strips disposed on said interior surface of said faceplate, each of said conductive strips contacting several of said plurality of photoemissive regions and electrically interconnecting all of said plurality of photoemissive regions.

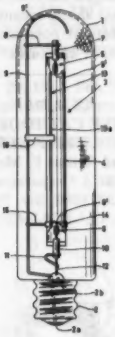
4,521,716
HIGH-PRESSURE METAL VAPOR DISCHARGE LAMP

Cornelis A. J. Jacobs; Johannes A. T. Schellen, and Anthonius P. Van Der Vleuten, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 9, 1982, Ser. No. 416,533
Claims priority, application Netherlands, Sep. 17, 1981, 8104282
Int. Cl.³ H01J *61/54*
U.S. Cl. 313—594 6 Claims

1. A high-pressure metal vapor discharge lamp having a discharge vessel comprising a radiation-transmitting wall and first and second main electrodes between which in the operative condition of the lamp the discharge takes place, said main electrodes each having an end directed towards the discharge, the discharge vessel furthermore comprising an external ignition auxiliary means which in the inoperative lamp condition the lamp is connected electrically to said first main electrode and extends from the end of said first main electrode or axially overlaps no more than 3 mm thereof and extends axially to the end of said second main electrode or to axially overlaps no more than 3 mm thereof, and is also present at a distance of at most 1 mm from the wall of the discharge vessel, said external ignition auxiliary means having the portion thereof near said second main electrode tightly engaging said wall, said external ignition auxiliary means includes a strip-shaped part, disposed proximate to said second main electrode, which in the inoperative condition of said lamp said strip-shaped part of the external ignition auxiliary means tightly engages said wall of said

discharge vessel over at least half the circumference thereof, said external ignition auxiliary means comprising a part which is movable with respect to said discharge vessel and which in



the inoperative condition of the lamp extends along the wall of said discharge vessel between the ends of said main electrodes and in the operative condition of said lamp is remote from said wall of said discharge vessel.

4,521,717

APPARATUS FOR PRODUCING A MICROWAVE PLASMA FOR THE TREATMENT OF SUBSTRATES, IN PARTICULAR FOR THE PLASMA-POLYMERIZATION OF MONOMERS THEREON

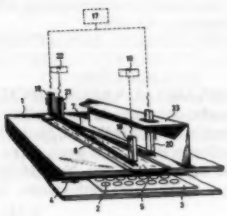
Jörg Kieser, Albstadt, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,339

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1981, 3141312

Int. Cl.³ H01J *7/46, 19/80*

U.S. Cl. 315—39 **13 Claims**



1. In apparatus for producing a plasma with microwaves for treating one or more substrates arranged on a planar substrate carrier with the plasma, the improvement comprising:

(a) a first elongated slow wave structure for radiating plasma-producing microwaves toward the substrate carrier having a longitudinal axis which is inclined to the plane of the substrate carrier at an acute setting angle; and

(b) a second elongated slow wave structure for radiating plasma-producing microwaves toward the substrate carrier having a longitudinal axis which is inclined to the plane of the substrate carrier at an opposite acute setting angle,

(c) the first and second slow wave structures being side by side on the same side of the substrate carrier,

whereby the intensity of the microwave from the slow wave structures vary oppositely along the axes thereof to minimize the net variation of the plasmas on the substrates.

12. In apparatus for producing a plasma with microwaves for treating one or more substrates arranged on a planar substrate carrier, the improvement comprising:

(a) a first elongated slow wave structure for radiating plasma-producing microwaves toward the substrate carrier having a longitudinal axis which is inclined to the plane of the substrate carrier at an acute setting angle;

(b) a second elongated slow wave structure for radiating plasma-producing microwaves toward the substrate carrier having a longitudinal axis which is inclined to the plane of the substrate carrier at an equal, but opposite acute setting angle,

(c) the first and second slow wave structures being side by side on the same side of the substrate carrier,

whereby the intensity of the microwave from the slow wave structures vary oppositely along the axes of the slow wave structures to minimize the net variation of the plasmas on the substrates;

(d) the slow wave structures each comprising means for defining a median plane of the microwaves therefrom such that the median planes are parallel to each other,

a pair of stringers extending parallel to the axis of each slow wave structure,

(f) crossbars extending transversely between the stringers of each slow wave structure,

(g) the crossbars having crossbars axes in the direction between the stringers of the respective slow wave structures which are spaced from the crossbar axes of the other wave-guide structure,

(h) the median plane of each slow wave structure being normal to the crossbar axes thereof; and

(i) reaction chamber means for permeably receiving the microwaves and containing an ionizable gas, a polymerizable monomer, and means for moving the substrate carrier in a direction transverse to the axes of the slow wave structures,

whereby the monomer is converted to a polymer and deposited as a coating on the substrates.

4,521,718

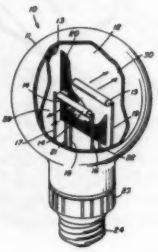
BEAM MODE LAMP WITH VOLTAGE MODIFYING ELECTRODE

Wojciech W. Byszewski, Arlington; A. Bowman Budinger, Westford, and Joseph M. Proud, Wellesley Hills, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 1, 1983, Ser. No. 462,736

Int. Cl.³ H05B *39/00*

U.S. Cl. 315—99 **6 Claims**



1. A beam mode discharge lamp of the type previously operating at approximately 20 volts comprising:

an envelope substantially transparent to visible light and defining a volume;

an electron excitable fill material permeating said volume;

a first discharge electrode and a second discharge electrode arranged within said envelope;

at least one modifying electrode, at least part of which is interposed between said first and second discharge electrodes;

means for applying AC line voltage to said first and second discharge electrodes, said first and second discharge electrodes functioning alternately as cathode and anode and forming electron beams between the discharge electrodes and extending into drift regions beyond the discharge electrodes; and

means for applying negative bias voltage with respect to the then cathode to said modifying electrode sufficient to allow the lamp to operate safely with line voltage between the first and second discharge electrodes.

4,521,719

ION BEAM GUN

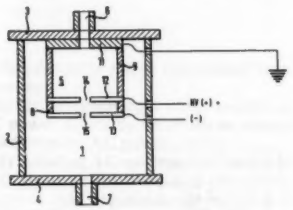
Gerhard Liebel, Munich, Fed. Rep. of Germany, assignor to Technics GmbH Europa, Kirchheim, Fed. Rep. of Germany

Filed Aug. 27, 1982, Ser. No. 412,172

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1981, 3134337

Int. Cl.³ H01J *7/24;* H05B *31/26*

U.S. Cl. 315—111.81 **6 Claims**



1. Ion beam gun comprising an ionization chamber which is provided with an ionization gas inlet and an ionization gas outlet, two ionization electrodes spaced from and in opposition to each other in the direction of the ion beam for ionizing the ionization gas; an extraction electrode permeable to the ion beams, said extraction electrode being arranged behind said two ionization electrodes in the direction of the ion beam; means for applying a high frequency and a high voltage to said two ionization electrodes, one of said two ionization electrodes, disposed between the other of said two ionization electrodes and said electrodes, and said extraction electrode each being provided with passages arranged in alignment with each other for passage of the ion beam.

4,521,720

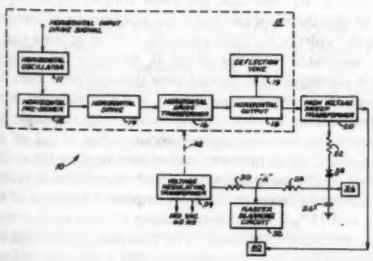
PROJECTION TV CRT BURN PROTECTION

Donald E. Griffey, Skokie, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed May 28, 1982, Ser. No. 383,040

Int. Cl.³ H01J *29/52*

U.S. Cl. 315—386 **7 Claims**



1. In a color projection television system having a horizontal drive circuit for energizing electron beam deflection means in generating horizontal output signals for displacing an electron beam across a phosphor-coated faceplate of a cathode ray tube in said projection color television system, said projection color television system further including high voltage transformer means coupled to said horizontal drive circuit and responsive to said horizontal output signals for generating high voltage signals for initiating and sustaining said electron beam in said cathode ray tube, a system for protecting the faceplate of said cathode ray tube comprising:

voltage sensing means coupled to said high voltage transformer means and responsive to said high voltage signals output therefrom for generating a first control signal when said horizontal output signals are removed from said high voltage transformer means;

raster blanking means coupled to said cathode ray tube and responsive to a second control signal provided thereto for terminating the electron beam in said cathode ray tube; and

a voltage source including an AC-energized voltage regulating transformer coupled to said horizontal drive circuit for providing an energizing voltage thereto and selectively coupled to said raster blanking means and said voltage sensing means for generating and providing a second control signal of increasing magnitude to said raster blanking means in response to said first control signal for rapidly terminating said electron beam when said horizontal drive circuit no longer draws said energizing voltage from said voltage source and said horizontal output signals are no longer provided by said horizontal drive circuit to said high voltage transformer means.

4,521,721

NUMERICAL CONTROL METHOD

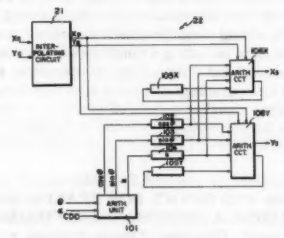
Mitsuo Kinoshita, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

Filed Jul. 16, 1982, Ser. No. 398,903

Claims priority, application Japan, Jul. 31, 1981, 56-120347

Int. Cl.³ G05B *19/24*

U.S. Cl. 318—573 **15 Claims**



1. A numerical control method for positionally controlling a movable element of a machine tool in such a manner that numerically controlled machining is performed along a projected path obtained by projecting a programmed path, lying on a predetermined plane, onto a plane of projection inclined at a predetermined angle with respect to the predetermined plane, said method comprising the steps of:

(a) entering path data specifying a programmed path on the predetermined plane and angle data specifying the predetermined angle;

(b) performing an interpolation on the basis of the entered path data to produce an output signal indicative of the results of the interpolation; and

(c) subjecting the output signal obtained in step (b) to a projective transformation in accordance with the entered projection angle data to generate a projective transformation output signal specifying the projected path, and posi-

tionally controlling the movable element on the basis of the projective transformation output signal.

4,521,722

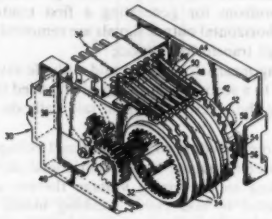
APPLIANCE CONTROLLER

Richard C. Barthel, Chicago, Ill., and Richard D. Roy, Valparaiso, Ind., assignors to The Singer Company, Stamford, Conn.

Continuation of Ser. No. 478,137, Mar. 23, 1983, Pat. No. 4,468,600. This application Mar. 8, 1984, Ser. No. 587,721

Int. Cl.³ G05B *19/06*

U.S. Cl. 318—578 **4 Claims**



1. A controller for an appliance having a plurality of selectively energizeable electromechanical components, comprising:

input means for operator selection of a desired cycle of operation of said appliance;

a motor;

switching means coupled to be driven by said motor and having a plurality of timing cams on a rotating member for controlling the operation of a plurality of switches for applying power to energize said components; and

sequencing means for selectively advancing said switching means including:

means for applying power to said motor;

means on said rotating member for defining incremental positions around said rotating member;

means for detecting movement of said rotating member from one of said positions to the next adjacent position;

means separate from said rotating member and reponsive to the selected operation cycle for defining a program for said rotating member which includes a series of operting steps each including a number of incremental positions to be moved and a time delay of operation; and

means for operating said power applying means to move said rotating member a defined number of incremental positions in accordance with said program.

4,521,723

METHOD AND DEVICE FOR BRAKING AN ASSEMBLY COMPRISING A TWO-PHASE SYNCHRONOUS MOTOR

Oudet Claude, Besancon, France, assignor to Portescap, La Chaux-de-Fonds, Switzerland

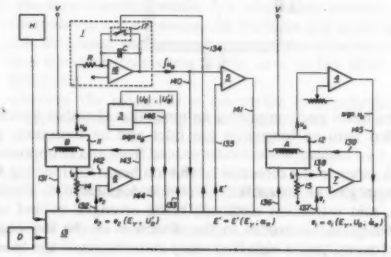
Filed Apr. 3, 1984, Ser. No. 596,276

Claims priority, application Switzerland, Apr. 7, 1983, 1870/83

Int. Cl.³ H02P *8/00*

U.S. Cl. 318—696 **5 Claims**

1. A method for braking an assembly comprising a twophase synchronous electric motor and a device driven mechanically by this motor, the load upon the motor being essentially that of inertia, the motor having a rotor magnetized so as to exhibit 2N poles of alternate polarity, N being a whole number, said poles revolving in the airgaps in at least two separate magnetic stator circuits arranged in accordance with the twophase mode of operation, said magnetic circuits being coupled to respective coils connected to a feeding and switching device arranged for feeding said coils with electric current so that the rotor is driven from one rest position to another, each rest position corresponding with a position of equilibrium capable of being maintained by feeding a coil associated with one or other of the phases of the motor, said method comprising the steps of cutting off the driving current in the coil or coils being fed from the instant when, during the motion of the rotor from a starting position towards a desired position of stoppage corresponding with an angle α_S, the state of feed corresponds with the control of the advance of the rotor towards the position $\alpha_S - 270°/N$; of integrating the voltage u_B induced in the coil or at least one of the coils associated with one of the phases, say, phase B of the motor, between the moment when it is detected that this voltage u_B is passing for the first time through zero since the said cutting-off of the driving current, and the moment when it is detected that the voltage u_A induced in the coil or at least one of the coils associated with the other phase, say, phase A of the motor, is passing for the first time through zero since the start of the integration of the voltage u_B; of storing the result of this integration, E_γ, as well as the absolute instantaneous value $|U_B|$ of the voltage u_B occuring at the moment when the integration ends, this value defining the velocity of the rotor at this moment; of feeding the coil or at least one of the coils associated with the phase A during the interval between the



end of the said integration and the moment at which the rotor reaches a predetermined angular position α_R lying between $\alpha_S - 20°/N$ and $\alpha_S - 70°/N$, with a braking current i_A such that the angular velocity α_R of the rotor at the time of its passage through said position α_R has a desired value chosen on the basis of its velocity corresponding with the stored value $|U_B|$, its own inertia, its load and frictional torques opposing its rotation, so that the rotor can reach the position α_S; of integrating again the voltage u_B induced in the coil or at least one of the coils associated with the phase B, between the moment when u_B is passing for the second time through zero since the said cutting-off of the driving current and the moment when this integral reaches a value corresponding with the angle α_R; of measuring the absolute instantaneous value $|U'_B|$ of the voltage u_B at said latter moment; and of then feeding the coil or at least one of the coils associated with the phase B with a braking current i_B determined by an empirical function of the values E_γ and $|U'_B|$, this function being chosen so that from experience the rotor at the time of its first passing through the rest position which is to be reached, has a desired residual velocity α_S which is very low with respect to α_R or practically zero.

4,521,724
APPARATUS FOR PROCESSING ENERGY REGENERATED BY AN AC MOTOR

Keiji Sakamoto, and Yukio Toyozawa, both of Hachioji, Japan, assignors to Fanuc Ltd., Tokyo, Japan

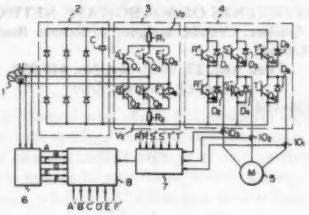
PCT No. PCT/JP83/00162, § 371 Date Apr. 5, 1984, § 102(e) Date Apr. 5, 1984, PCT Pub. No. WO83/04349, PCT Pub. Date Dec. 8, 1983

PCT Filed May 26, 1983, Ser. No. 588,870

Claims priority, application Japan, May 26, 1982, 57-88006

Int. Cl.³ H02P *3/18*

U.S. Cl. 318—762 **6 Claims**



1. An apparatus for processing energy regenerated by an AC motor which comprises:

a rectifier circuit (2) for supplying a direct current to the lines of a DC power source by rectifying an alternating current supplied from an AC power source;

a drive circuit (4) including AC motor driving semiconductor switches (Q_7 to Q_{12}) connected across the lines of said DC power source, said semiconductor switches being rendered conductive upon the receipt of a PWM signal when the AC motor is to be driven so as to supply the electric current from the lines of said DC power source to each of the phases of said AC motor;

a regenerated energy processing circuit connected across the lines of said DC power source, including regenerated energy processing semiconductor switches (Q_1 to Q_6) for returning the energy regenerated by said AC motor to said AC power source, and resistors (R_1 and R_2) for protecting said regenerated energy processing semiconductor switches;

current direction detectors (10_1, 10_2, and 10_3) for detecting the direction of the current flowing through each of the phases of said AC motor;

a regeneration detection logic circuit (7) for producing a regeneration detection signal when said AC motor driving semiconductor switches are nonconductive and when the direction of the current detected by the current direction detectors is opposite to the direction of the current when said AC motor is driven; and

a regeneration drive circuit (8) for driving said regenerated energy processing semiconductor switches responsive to said regeneration detection signal.

4,521,725
SERIES SWITCHING REGULATOR

Charles A. Phaneuf, Stuart, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 2, 1983, Ser. No. 557,676

Int. Cl.³ G05F *1/56*

U.S. Cl. 323—282 **4 Claims**

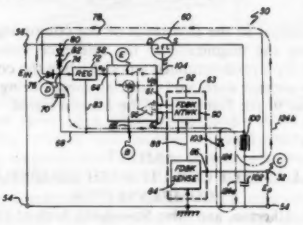
1. Series switching voltage regulator responsive to a source DC voltage signal received between an input terminal and signal ground, for providing a regulated amplitude DC voltage signal between an output terminal and signal ground, comprising:

output filter means, including inductor means connected between the output terminal and a switching bus means;

gated switch means, having a signal input connected to the source DC voltage signal at the regulator input terminal, a signal output connected to said switching bus, and a gate terminal, said gated switching means alternatively connecting and disconnecting the source DC voltage signal to said switching bus in response to a pulse width modulated (PWM) gate signal presented to said gate terminal;

feedback sensing means, for providing a feedback signal indicative of the actual value of the regulated amplitude DC voltage signal;

pulse width modulator means, having a low voltage potential input connected to said switching bus and a high voltage potential input responsive to high voltage potential signals provided thereto from a summing junction, said modulator means responsive to said feedback signal and said high potential signal for providing, in dependence on said feedback signal magnitude, said PWM gate signal to said switch means at a signal amplitude proportional to said high potential signal amplitude; and



bootstrap circuit means, including storage capacitor means responsive to the difference voltage magnitude between said switching bus and said summing junction for storing said difference voltage therein, and signal coupling means connected between said summing junction and the regulator output terminal for maintaining said difference voltage magnitude stored in said storage capacitor means at a minimum value substantially equal to said regulated amplitude DC voltage value, said bootstrap circuit providing to said summing junction, in the presence of each of said gate signals, said high potential signal at an amplitude greater than the source DC signal amplitude, whereby said gate signal amplitude to said switch means gate terminal is greater than said source DC signal amplitude at said switch means signal input.

4,521,726
CONTROL CIRCUITRY FOR A PULSE-WIDTH-MODULATED SWITCHING POWER SUPPLY

Brian J. Budnik, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 322,140, Nov. 17, 1981, abandoned. This application Oct. 3, 1983, Ser. No. 537,555

Int. Cl.³ G05F *1/56*

U.S. Cl. 323—283 **15 Claims**

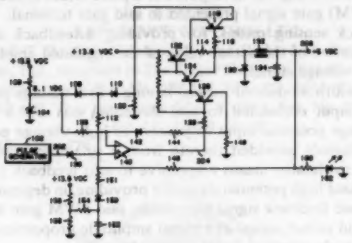
1. Control circuitry for a pulse-width-modulated power supply including switching means responsive to a first state of a control signal for coupling an input voltage from an input voltage source to output means and to a second state of the control signal for decoupling the input voltage from the output means for generating an output voltage, said control circuitry comprising:

a pulse signal source for generating a train of pulses at a predetermined repetition frequency;

a reference signal source for generating a reference voltage;

means, having a first input coupled by input resistor means to the reference voltage and a second input coupled by the output means to the output voltage, for comparing the output voltage to the reference voltage and generating at its output the first state of the control signal in response to each

pulse from the pulse signal source and the second state of the control signal when the magnitude of the output voltage is substantially equal to the reference voltage; and



means coupled to the first input of the comparing means for reducing the magnitude of the reference voltage applied thereto by a predetermined amount when the control signal has the second state, said reducing means being disabled in response to the first state of the control signal.

4,521,727

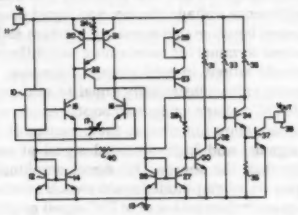
HALL EFFECT CIRCUIT WITH TEMPERATURE COMPENSATION

James H. Atherton, and Silvo Stanojevic, both of Freeport, Ill., assignors to Honeywell Inc.

Filed May 23, 1983, Ser. No. 497,311

Int. Cl.³ H03K *17/90*

U.S. Cl. 323—294 **17 Claims**



1. A circuit for providing a temperature independent switched output responsive to magnetic field strength comprising:

a Hall effect element having a pair of bias terminals located along a first axis providing for an electrical current therebetween and a pair of output terminals located along a second axis perpendicular to the first axis between which a Hall voltage is generated when said Hall effect element is subjected to a magnetic field having a component along a third axis perpendicular to the first and second axes;

power supply means for supplying a voltage between a supply conductor and a ground conductor;

first connecting means connecting said Hall effect element through its bias terminals between the supply conductor and the ground conductor;

first and second current carrying branches, one of which includes an impedance device;

first control means for controlling the sum of the currents carried by said first and second branches in response to the current through said Hall effect element;

second control means for differentially controlling the currents carried by said first and second branches in response to the Hall voltage; and

comparison means including an active load device operating such that a current of predetermined magnitude between first and second terminals thereof results in a current of the same magnitude between first and third terminals thereof, the first terminal being connected to the supply conductor and the second and third terminals comprising portions of said second and first branches respectively, said comparison means being operable to produce an output signal dependent on the relative magnitudes of the Hall voltage and the reference voltage and producing a switched output upon occurrence of a predetermined relationship between the Hall and reference voltages.

4,521,728

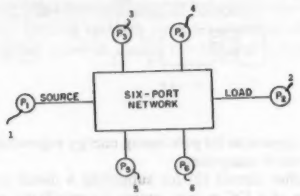
METHOD AND A SIX PORT NETWORK FOR USE IN DETERMINING COMPLEX REFLECTION COEFFICIENTS OF MICROWAVE NETWORKS

Shihe Li, Quebec, Canada, assignor to Renato Bosisio, Mont-Royal, Canada

Filed Aug. 23, 1982, Ser. No. 410,856

Int. Cl.³ G01R *27/04*

U.S. Cl. 324—58 R **31 Claims**



1. A six port network for use in determining a complex reflection coefficient associated with a microwave network, comprising:

coupling means mounted between a first port and a second port of the six port network for transmitting microwave energy from a microwave source connected to the first port, to the microwave network connected to the second port, said coupling means including means for providing a first signal representative of the microwave energy supplied to the first port, and a second signal representative of the transmitted microwave energy reflected at the microwave network; and

means for transforming said first and second signals into first, second, third and fourth microwave power readings that can be used for calculating the value of the complex coefficient associated with the microwave network and for supplying said power readings to third, fourth, fifth and sixth ports of the six port network, respectively, said power readings being respectively proportional to $|a|^2$, $|1+ae^{j\phi}\Gamma|^2$, $|1+ae^{j(\phi+120°)}\Gamma|^2$ and $|1+ae^{j(\phi-120°)}\Gamma|^2$, wherein Γ is the complex reflection coefficient associated with the microwave network, a is a constant representing a calibrated parameter of the six port network, a is the microwave energy supplied to said first port, and ϕ is an arbitrary phase angle.

4,521,729

INSTRUMENT FOR MEASURING THE DEFORMING CAPACITY OF RED BLOOD CORPUSCLES

Holger Kiesewetter, Schneebergweg 211, D-5100 Aachen; Heinz Myrenne, Steffensgasse 9, D-5106 Roetgen, and Hans-Gunther Roggenkamp, Kullenhofstrasse 36, D-5100 Aachen, all of Fed. Rep. of Germany

Filed Apr. 28, 1983, Ser. No. 489,672

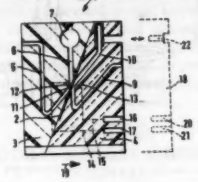
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215719

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—71.1 **22 Claims**

1. In an apparatus for measuring the deformation capacity of erythrocytes comprising at least one sample vessel, a piece of foil walling said vessel off into two sample spaces, said foil

having an opening therethrough for the motion of the liquid placed in the apparatus as a sample, said opening having a diameter smaller that the major quiescent diameter of an erythrocyte, means for producing a pressure head across the said foil in a buffer liquid placed in said vessel for causing a flow of said liquid through said opening, at least two electrodes placed on



opposite or different sides of said foil, means for supplying said electrodes with voltage, and a voltage measuring system for measuring changes in said voltage at said electrodes on an erythrocyte making its way through said opening in a transit therethrough, wherein said measuring system times said transit.

4,521,730

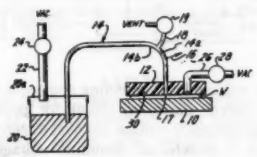
MERCURY PROBES

Carl Shulman, Edgewater, N.J., assignor to MSI Electronics Inc., Woodside, N.Y.

Continuation-in-part of Ser. No. 226,357, Jan. 19, 1981. This application Sep. 7, 1983, Ser. No. 530,195

Int. Cl.³ G01R *1/06, 31/26;* H01R *3/04*

U.S. Cl. 324—158 F **20 Claims**



1. Mercury-probe apparatus including a mercury reservoir, an aperture member having a test aperture therein, means for forming a mercury contact to a test wafer placed against said aperture member, and contact-forming means including mercury passage means extending between said test aperture and the mercury in the reservoir, said mercury passage means including a mercury probe segment terminating at said test aperture and said mercury probe segment having a test circuit connection thereto, said mercury contact means also including means for developing a pressure difference between the mercury in the reservoir and the test aperture for causing the mercury to fill said mercury passage means from the reservoir to the test aperture, said mercury probe segment and said reservoir having an electrical connection therebetween at least when said passage means is filled with mercury, and means interposed along said mercury passage means between the reservoir and said mercury probe segment for introducing electrical insulation in place of at least part of said electrical connection.

4,521,731

DETECTOR ATTACHMENT ARRANGEMENT

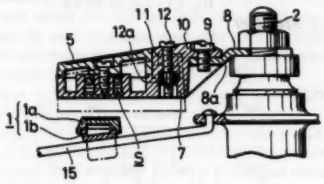
Takashi Uyeda, and Masaaki Matsumoto, both of Sakai, Japan, assignors to Tsuyama Mfg. Co., Ltd., Japan

Filed Aug. 2, 1982, Ser. No. 404,311

Claims priority, application Japan, Aug. 18, 1981, 56-122702[U]

Int. Cl.³ G01P *3/48, 3/12*

U.S. Cl. 324—174 **12 Claims**



1. An arrangement for the attachment of means for the detection of speed of a wheel comprising a rotary member mounted for rotation with said wheel, said rotary member comprising magnet means arranged therein, and mount means for securing said rotary member to said wheel, and a detector comprising a magnetic flux sensor which operates when it enters a magnetic field generated by said rotary member, said detector being non-rotably clamped to hold said sensor within said magnetic field, said wheel being adapted to be rotatably supported on the hub of a wheel, said detector including an adjuster mechanism that is fixed to said hub, said adjuster mechanism being adjustably fixed relative to the detector so as to adjust the position of the detector relative to said rotary member to a predetermined interval.

4,521,732

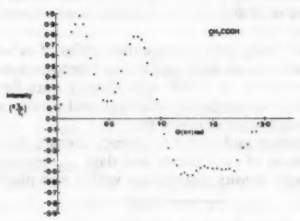
PULSE SEQUENCE FOR USE IN PERFORMING NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY

David T. Pegg, 7 Fanfare St., Eight Mile Plain; David M. Doddrell, 30 Belinda Crescent, Springwood, and Max R. Bendall, 274 Ford Rd., Burbank, all of Brisbane, Queensland, Australia

Continuation-in-part of Ser. No. 358,636, Mar. 16, 1982, abandoned. This application Feb. 15, 1983, Ser. No. 466,543

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—300 **21 Claims**



1. A method of operating a nuclear magnetic resonance spectrometer in relation to a sample comprising two types of heteronuclei, said method comprising applying three sequential radiofrequency pulses to said sample, the first pulse being applied to the first type of nuclei, the second pulse being applied to the second type of nuclei and the third pulse being applied to the first type of nuclei, adjacent pulses being separated by a period and the third pulse being followed by a period during which heteronuclear scalar coupling interactions between the two types of nuclei evolve, and then detect-

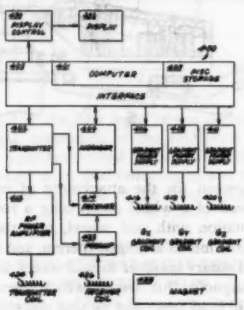
ing and Fourier transforming the free induction decay of the second type of nuclei.

4,521,733

NMR IMAGING OF THE TRANSVERSE RELAXATION TIME USING MULTIPLE SPIN ECHO SEQUENCES

Paul A. Bottomley, Clifton Park, and William A. Edelstein, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 23, 1983, Ser. No. 497,358
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—309 **46 Claims**



1. A method of generating NMR image data using multiple spin echo pulse sequences and multiple angle projections for producing images having an improved signal to noise ratio, comprising:

(a) selectively exciting nuclear spins within a planar slab of a sample and then applying a series of 180° nonselective radio frequency pulses to said sample at spaced time intervals to produce a corresponding series of m spin echo signals in the intervals following said 180° pulses, each spin echo having an associated signal to noise ratio;

(b) said selecting and applying steps being repeatedly performed for a succession of projections with distinct imaging magnetic field gradients being employed for each of said succession of projections;

(c) converting each of said series of spin echo signals in step (a) into a time series of values and averaging temporally corresponding points of said time series to produce an average time series of values representative of all of said spin echoes whereby the signal to noise ratio of said signal is improved by a factor related to the square root of the number m of distinct spin echoes in said series of spin echo signals;

(d) transforming said average time series of values, derived from said m spin echo signals, into frequency-domain data representative of NMR spin density data for predetermined spatial projections through said sample, and storing said frequency domain data;

(e) processing said stored frequency domain data from said succession of projections into data representative of nuclear spin density distribution within said planar slab.

4,521,734

PULSED MAIN FIELD NUCLEAR MAGNETIC RESONANCE IMAGING SYSTEM

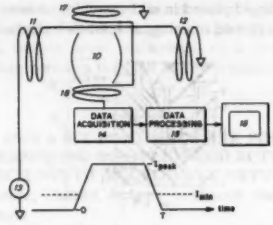
Albert Macovski, 2505 Alpine Rd., Menlo Park, Calif. 94025

Filed Jan. 13, 1983, Ser. No. 457,589
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—313 **12 Claims**

1. In a method for imaging a region of the body using nuclear magnetic resonance where the main magnet has a controllable field amplitude the steps of:

applying gradient fields;

increasing the amplitude of the main magnetic field during the image data acquisition time interval including the excitation and reception intervals for a time shorter than the thermal time constant of the main magnet;



decreasing the amplitude of the main magnetic field during times that image data is not being acquired; and

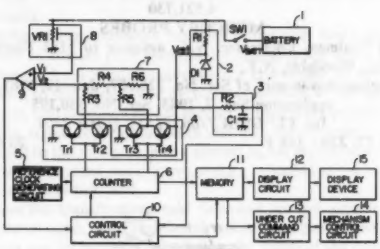
processing the nuclear magnetic resonance signals to provide spatial information for creating an image.

4,521,735

BATTERY VOLTAGE LEVEL DETECTING APPARATUS

Yoshikazu Kageyama, Moriguchi; Sakon Nagasaki, Katano, and Mineo Mino, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 25, 1982, Ser. No. 436,351
Claims priority, application Japan, Oct. 28, 1981, 56-173510; Oct. 19, 1982, 57-183953
Int. Cl.³ G01N *27/46*
U.S. Cl. 324—433 **8 Claims**



1. A battery voltage level detecting apparatus comprising:

a reference voltage generating circuit for generating a predetermined reference voltage unequal to zero voltage and lower than a preselected minimum voltage capable of enabling a load instrument;

a battery voltage detecting circuit connected to a battery for generating a battery detection voltage varying in correspondence to a variation in the voltage of said battery;

a reference clock generating circuit for generating reference clock pulses;

a control circuit receiving said references voltage, said control circuit generating first and second control signals;

a counter responsive to said first control signal to count up or down in synchronism with said reference clock pulses and generate count output signals;

a voltage conversion circuit, responsive to the outputs of said counter and said reference voltage generating circuit, for converting said count output signals to a corresponding digital output signal composed of either a zero voltage or said reference voltage;

a D-A conversion circuit for converting said digital output signal to a corresponding analog output voltage;

a comparison circuit for comparing said battery detection voltage of said battery voltage detecting circuit and said

analog output voltage of said D-A conversion circuit to generate a high or low level output signal;

said control circuit being responsive to said high or low level output signal to generate said first control signal and responsive to the changeover of said high or low level output signal between the high and low levels to generate said second control signal and then preset said counter;

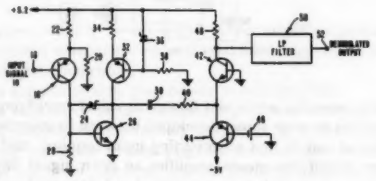
a memory circuit connected to said counter and said control circuit and responsive to said second control signal to store data to the count value of said counter; and

a display circuit for displaying said stored data of said memory circuit on a battery voltage level display device.

4,521,736
DEMODULATOR FOR PULSE WIDTH MODULATED SIGNALS

John O. Ryan, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed May 9, 1979, Ser. No. 37,554
Int. Cl.³ H03D *1/18*
U.S. Cl. 329—102 **9 Claims**



1. A demodulator circuit for demodulating high frequency pulse width modulated signals wherein the input signal information is represented by time-variable pulse widths, comprising the combination of;

capacitor means for receiving a charge which is proportional to the input pulse width;

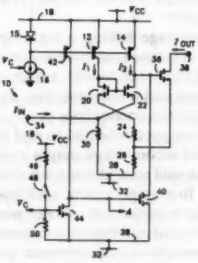
output switch means coupled to the capacitor means for enabling the capacitor to charge in the presence of an input pulse, and for reading out the capacitor charge simultaneously with enabling the capacitor to discharge upon completion of the pulse; and

wherein the discharge current represents the charge received by the capacitor means and thus the demodulated signal.

4,521,737
BIPOLAR-MOS CURRENT AMPLIFIER HAVING ACTIVE TURN-OFF CIRCUITRY

Byron G. Bynum, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 22, 1984, Ser. No. 582,357
Int. Cl.³ H03F *3/16*
U.S. Cl. 330—51 **7 Claims**



3. In a current amplifier circuit including a current source coupled to a power supply conductor for providing turn on current whenever an operating potential is supplied to the power supply conductor and a circuit responsive to the turn on current for forward biasing an output MOS transistor coupled thereto, an active turn-off circuit for inhibiting turn on of the output MOS transistor due to voltage transients that may occur on the power supply conductor, comprising:

a transistor of a first conductivity type having base, emitter and collector electrodes, said base and emitter electrodes being coupled to the power supply conductor;

a MOS transistor of a second conductivity type having gate, source and drain electrodes, said gate electrode being connected to said collector electrode of said transistor, said drain electrode being connected to the gate electrode of the output MOS transistor;

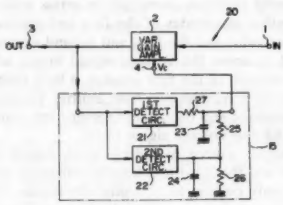
circuit means for connecting said source of said MOS transistor to a reference potential; and

switch means connected to said gate electrode of said MOS transistor for rendering said MOS transistor non-conducting in response to a circuit turn-on command signal and for rendering said MOS transistor conducting to thereby inhibit the output MOS transistor in response to a circuit turn-off command signal.

4,521,738
GAIN CONTROL CIRCUIT

Kenzo Akagiri, and Masayuki Katakura, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 246,392, Mar. 23, 1981, Pat. No. 4,422,049. This application Sep. 21, 1983, Ser. No. 534,509
Claims priority, application Japan, Mar. 24, 1980, 55-37112
Int. Cl.³ H03G *7/00*
U.S. Cl. 330—134 **19 Claims**



1. A gain control circuit including variable gain amplifier means having input, output and control terminals, and control means for generating a control signal applied to said control terminal for controlling the gain with which said variable gain amplifier means amplifies an input signal applied to said input terminal for providing an output signal to said output terminal, said control means comprising:

first detector means for detecting a signal passed through the amplifier means and providing a first detector output representative of the level of said signal passed through the amplifier means;

second detector means for detecting said signal passed through the amplifier means and providing a second detector output representative of the level of said signal passed through the amplifier means;

first and second capacitors respectively connected at one side thereof to said first and second detector means and at the other side thereof to ground so as to be chargeable by said first and second detector outputs, respectively;

said one side of said first capacitor being connected with said control terminal of the variable gain amplifier means so that the charge on said first capacitor constitutes said control signal;

a first resistor connected between said one sides of said first and second capacitors; and

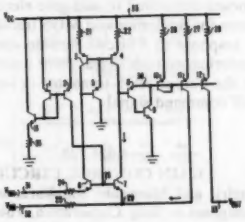
a second resistor connected with said one side of said second capacitor for the discharge of said second capacitor through said second resistor and for the discharge of said first capacitor through said first and second resistors only after substantial discharge of said second capacitor through said second resistor so that the discharge time constant of said first capacitor is varied in accordance with said second detector output.

4,521,739

LOW OFFSET VOLTAGE TRANSISTOR BRIDGE TRANSCONDUCTANCE AMPLIFIER

William A. Peterson, Hanover Township, Morris County, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 26, 1983, Ser. No. 498,257
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—257 **5 Claims**



1. A transconductance amplifier comprising:

a differential input stage operative for accepting a voltage signal input and including:

first and second transistors having their base electrodes connected together to receive a common bias signal,

first and second resistors connected in series with first and second emitter electrodes of the first and second transistors respectively, and the first and second resistors being connected to sense the voltage signal input; whereby a series connection of the first resistor, a base emitter junction of the first transistor, a base emitter junction of the second transistor and the second resistor are connected in parallel with the voltage signal input

a current mirror source including third, fourth and fifth transistors and the third and fourth transistors being coupled to supply current to collector electrodes of the first and second transistors respectively, and the fifth transistor being coupled jointly to a base electrode of the third and fourth transistors for controlling a base current therein, and

output means coupled to a node joining the second and fourth transistors and including a sixth transistor for providing a current feedback signal connected to the second emitter.

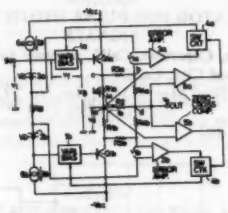
4,521,740

BIAS CURRENT COMPENSATED AMPLIFIER

Kazuaki Nakayama, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,637
Int. Cl.³ H03F *3/26*
U.S. Cl. 330—267 **10 Claims**

1. An emitter-follower type SEPP circuit comprising: first and second amplifying elements connected in and biased in emitter-follower and Class B SEPP configurations; first and second load means coupled, respectively, between output electrodes of said first and second amplifying elements and an output terminal; first and second signal summing means having first inputs coupled to an input terminal and outputs coupled to input electrodes of said first and second amplifying elements, respectively; first and second error signal amplifying means provided for said first and second amplifying elements, respectively, each of said first and second error signal amplifying means having first and second noninverting input terminals and an inverting input terminal, said inverting input terminals being coupled to said output electrodes of said first and second amplifying elements, respectively, and said first and second error signal amplifying means having outputs coupled to second inputs of said first and second signal summing means, respectively; first and second means for level shifting an input signal present on said input terminal coupled between said input terminal and said first noninverting input terminals of said first and second error signal amplifying means, respectively; and first and second means for level shifting an output signal present on said output terminal coupled between said output terminal and said second noninverting input terminals of said first and second error signal amplifying means, respectively; wherein, while said first error signal amplifying means amplifies an error signal developed between its inverting input terminal and its first noninverting input terminal, said second error amplifying means amplifies an error signal developed between its inverting input terminal and its second noninverting input terminal, and while said second error amplifying means amplifies an error signal developed between its inverting input terminal and its first noninverting input terminal, said first error amplifying means amplifies an error signal developed between its inverting input terminal and its second noninverting input terminal.

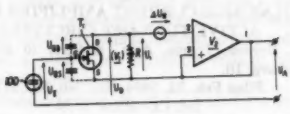


4,521,741

IMPEDANCE TRANSFORMER CIRCUIT

Ernst Ruberl, Guntramsdorf, Austria, assignor to AKG Akustische u.Kino-Geräte Gesellschaft m.b.H., Austria

Filed Oct. 20, 1982, Ser. No. 435,501
Claims priority, application Austria, Oct. 22, 1981, 4523/81
Int. Cl.³ H03F *3/04*
U.S. Cl. 330—277 **16 Claims**



1. An impedance transformer circuit for a capacitive voltage source comprising:

a first amplifier stage having a high input impedance and gain, a load resistance, an output and two inputs;

a second amplifier stage having a high gain, an output, an inverting input and a non-inverting input; and

a reference potential connection;

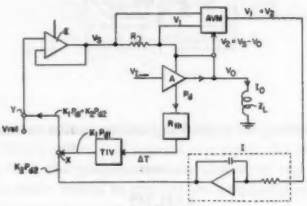
said first stage output connected to said second stage inverting input, said second stage output connected in feedback connection to said second stage non-inverting input and to one of said first stage inputs, said load resistance being controlled by a capacitive voltage source connected between the other of said first stage inputs and said reference potential connection, said reference potential connection not being connected to any input of said first and second amplifier stages, and said load resistance of said first amplifier stage being connected between said inverting and non-inverting inputs of said second amplifier stage.

4,521,742

AMPLIFIER POWER SUPPLY WITH LARGE DYNAMIC HEADROOM

Erik Edvardsen, London, England, assignor to NAD Holding Limited, London, England

Continuation of Ser. No. 327,424, Dec. 4, 1981, abandoned. This application Feb. 22, 1984, Ser. No. 582,013
Int. Cl.³ H03F 3/04
U.S. Cl. 330—289 22 Claims



1. A power supply for use with a power amplifier having a predetermined maximum time-averaged operating power, said power supply comprising,

means capable of supplying power to said amplifier,

means responsive to the instantaneous power dissipated in said amplifier for controlling the power provided by said supplying means to said amplifier so that, under steady-state conditions, the instantaneous power provided to said amplifier is at most equal to said maximum time-averaged operating power, and

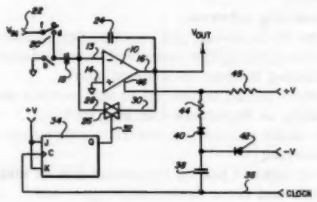
means for delaying the operation of said controlling means for a first predetermined time interval so that the instantaneous power supplied by said supplying means to said amplifier can exceed said predetermined maximum time-averaged operating power for said first predetermined time interval.

4,521,743

SWITCHED CAPACITOR AMPLIFIER

Malcolm L. Heimer, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Dec. 29, 1983, Ser. No. 566,701
Int. Cl.³ H03F 3/04
U.S. Cl. 330—296 13 Claims



1. A switched capacitor amplifier comprising:

an operational amplifier having an inverting input terminal, a non-inverting input terminal, a bias current input terminal, and an output terminal;

a capacitor coupled to said inverting input terminal of said operational amplifier;

timing means coupled to said operational amplifier for providing a plurality of timing cycles;

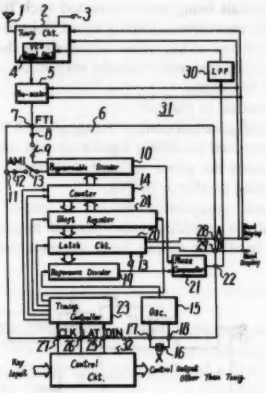
current generating means responsive to said timing means for providing a high bias current only at the beginning of each timing cycle to the bias input terminal of said operational amplifier.

4,521,744

TUNING APPARATUS OF PHASE-LOCKED LOOP TYPE

Takaaki Yamada, Zama; Yukio Tsuda, Atsugi, and Akira Yamakoshi, Saitama, all of Japan, assignors to Sony Corporation, Tokyo

Filed Dec. 17, 1982, Ser. No. 450,793
Claims priority, application Japan, Dec. 22, 1981, 56-207303
Int. Cl.³ H03L 7/08
U.S. Cl. 331—1 A 4 Claims



1. A tuning apparatus of the type including a phase-locked loop comprising:

a voltage controlled oscillator which is working as a local oscillator and producing a first output signal;

a phase-locked loop integrated circuit including programmable divider means responsive to said first output signal of said voltage controlled oscillator to produce a second output signal, reference frequency signal generating circuit means producing a third output signal, phase comparator means supplied with said second and third output signals for providing a controlling output to said voltage controlled oscillator in response to said second and third output signals, and memory means; and

control circuit means formed separately from said phase-locked loop integrated circuit for supplying control data to said memory means serially;

said memory means being responsive to control data stored therein to supply said control data in parallel to a selected one of said programmable divider means and said reference frequency signal generating means for fine control of said second and third output signals, respectively.

4,521,745

INTERACTIVE NON-HIERARCHICAL ADAPTIVELY SYNCHRONIZED OSCILLATOR NETWORK AND PHASE LOCKED LOOP OSCILLATOR FOR USE THEREIN

Robert M. Falconer, Ipswich, England, assignor to British Telecommunications, England

Filed Jun. 3, 1982, Ser. No. 384,475
Claims priority, application United Kingdom, Jun. 8, 1981, 8117487
Int. Cl.³ H03L 7/00
U.S. Cl. 331—2 11 Claims

1. A network of at least three terminals each being interconnected to the others by respectively associated incoming and outgoing signal links therebetween, each terminal comprising:

a controlled-frequency oscillator having a control input connection and an output,

a locking circuit means having an output coupled to said control input connection of the oscillator to synchronize

the frequency of the oscillator with the frequency of an incoming signal to the terminal when coupled to a central input of the locking circuit, and

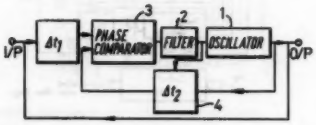
reconfiguration control means operative to monitor a plurality of incoming signals to the terminal on said incoming links thereto and to connect the control input of the locking circuit to any one of said incoming signal links, and to connect or disconnect the local oscillator output to or from the outgoing links from the terminal;

the terminals being interconnected such that each is linked via its respective incoming signal links to an output link of at least one of the other terminals in the network to receive output signals from the respective oscillator in those other terminals;

characterized in that:

the reconfiguration control means in each terminal monitors the received incoming signals on said incoming links and compares the phase of each with that of its own corresponding oscillator output,

when said comparison detects an out-of-phase incoming signal the reconfiguration control means disconnects its own oscillator output from its own outgoing links and



connects the locking circuit control input to one of the incoming signals,

when said comparison does not detect an out-of-phase incoming signal the reconfiguration control means connects its own oscillator output to its own outgoing links,

the reconfiguration control means is further operative to detect whether its oscillator has locked or remains locked to an incoming signal to which it has been connected, and

(i) if so, to connect its oscillator output to its outgoing links, and if there remains another out-of-phase incoming signal, to connect its locking circuit control input to said another out-of-phase incoming signal,

(ii) if it has not locked, to connect its locking circuit control input to any other one of the incoming signal links for which lock has not yet been attempted, until all incoming signal links have been connected without locking, and then to reconnect its own oscillator output to its own outgoing links,

so that the plurality of terminals tend towards stable synchronization provided that a forward path exists directly or indirectly from any one terminal, which then becomes the master, to the remaining terminals, which become the slaves.

4,521,746

MICROWAVE OSCILLATOR WITH TM01δ DIELECTRIC RESONATOR

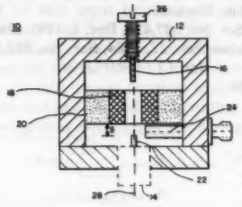
Eugene J. Hwan, San Carlos, Calif., and Darko Kajfez, Oxford, Miss., assignors to Harris Corporation, Melbourne, Fla.

Filed Aug. 31, 1983, Ser. No. 527,953
Int. Cl.³ H01P 7/10; H03B 5/18
U.S. Cl. 331—96 **9 Claims**

1. A microwave oscillator comprising

a tubular dielectric resonator operating in a TM01δ mode and having a resonant oscillation frequency,

an adjustable dielectric tuning rod located coaxially to said resonator for tuning to the resonant frequency of said resonator, said resonator and said tuning rod having similar dielectric properties, and



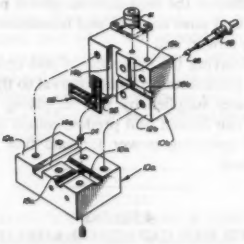
a metal housing for supporting said resonator and said tuning rod.

4,521,747

SUSPENDED STRIPLINE VARACTOR-TUNED GUNN OSCILLATOR

Raghbir S. Tahim, Buena Park; George M. Hayashibara, Wilmington, and Kai Chang, Rancho Palos Verdes, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 11, 1983, Ser. No. 540,471
Int. Cl.³ H03B 9/14
U.S. Cl. 331—107 SL **8 Claims**



1. A voltage-controlled oscillator with high power output characteristics at millimeter-wavelength frequencies, said oscillator employing integrated-circuit techniques and comprising:

a Gunn diode circuit fabricated as a suspended stripline, and including

an insulating substrate,

a Gunn diode contact pad on a first face of said substrate,

a dc bias input circuit connected to said contact pad and including lowpass filter means, and

an output circuit connected to said contact pad and including an impedance-matching section;

a Gunn diode mounted in electrical connection with said contact pad;

a varactor contact pad on the second face of said substrate opposite said Gunn diode contact pad; and

a varactor diode mounted in substantial alignment with said Gunn diode, in contact with said varactor contact pad.

4,521,748

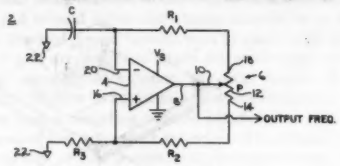
ADJUSTABLE FREQUENCY OSCILLATOR

Lawrence J. Ryczek, Nashotah, and William J. Janutka, West Allis, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 30, 1983, Ser. No. 509,951
Int. Cl.³ H03K 3/023
U.S. Cl. 331—108 D **16 Claims**

1. An adjustable frequency oscillator comprising in combi-

nation comparator means having a comparing input terminal connected to an RC charging current circuit, and a reference threshold input terminal, and comparing voltage at said comparing input terminal due to said charging current against



threshold trip voltage at said reference terminal, and single means at the output of said comparator means for concurrently changing both charging current and threshold trip voltage for said comparator means to change the frequency of oscillation of said comparator means output.

4,521,749

SIMULTANEOUS AMPLITUDE AND ANGLE MODULATION USING DETECTION OF COMPLEX ZEROES

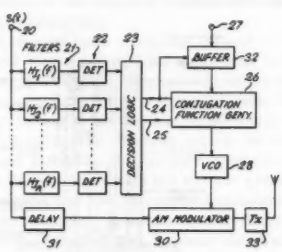
Gordon B. Lockhart, Leeds, England, assignor to National Research Development Corporation, London, England

Filed Sep. 20, 1982, Ser. No. 420,572

Claims priority, application United Kingdom, Oct. 1, 1981, 8129654; Dec. 8, 1981, 8137002

Int. Cl.³ H03C *1/00, 3/00;* **H03D** *5/00*

U.S. Cl. 332—17 **18 Claims**



1. A method of modulating a carrier signal using both amplitude and angle modulation, comprising the steps of

detecting the occurrence, and imaginary root values, of complex zeros in a first modulating signal,

angle modulating the carrier signal on the occurrence of at least some complex zeros, the magnitude of the angle modulation being a function of the respective imaginary root values detected for those zeros and of a second modulating signal having not more than three possible values, and

amplitude modulating the angle modulated carrier signal in accordance with the first modulating signal.

4,521,750

CHARACTERISTIC SWITCHING CIRCUIT

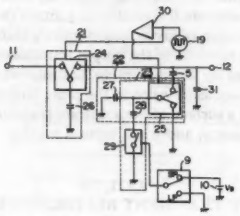
Isao Fukushima; Kazuyoshi Kuwahara; Keiichi Itoigawa; Yasunori Kobori, and Hideo Nishijima, all of Katsuta, Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,793

Claims priority, application Japan, Apr. 9, 1982, 57-58146

Int. Cl.³ H03H *11/06, 11/40*

U.S. Cl. 333—28 R **8 Claims**



1. A circuit having selectable switching characteristics comprising:

at least one equivalent resistive means for producing a resistance, said resistive means including a first capacitor element having one terminal grounded and a first switching means having first, second and third terminals, another terminal of said first capacitor element being connected with said third terminal of the first switching means, said first switching means being connected between the first and third terminals and between the second and third terminals alternately in response to a clock signal thereby to produce said equivalent resistance between said first and second terminals of the first switching means;

another capacitor element having one terminal grounded; and

a second switching means connected between said another terminal of said first capacitor element and another terminal of said another capacitor element, said second switching means being opened or closed by a control signal thereby to change the characteristics of said circuit selectively.

4,521,751

ELECTRONIC COMPONENT FUNCTIONING WITH REFLECTED ACOUSTIC WAVES

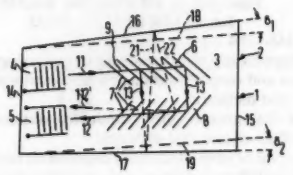
Gerd Riha, Munich, and Richard Veith, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 4, 1983, Ser. No. 520,451

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, 3230566

Int. Cl.³ H03H *9/25, 9/42, 9/64*

U.S. Cl. 333—151 **9 Claims**



1. An electronic component functioning with a reflected acoustic wave, comprising: a substrate body; at least one reflector means on the substrate body with reflector fingers disposed at an oblique angle relative to a propagation direction

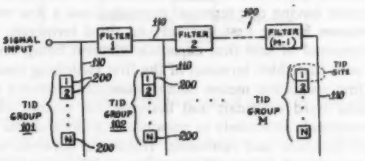
of an incoming primary acoustic wave; an input transducer means on the substrate body exciting the acoustic wave; at least one output transducer means on the substrate body having an acoustic wave receiving aperture; the substrate body having two opposite longitudinal edges extending along a primary propagation direction of the acoustic wave proceeding from the input transducer means; a disruptive weave being emitted from said reflector means and being reflected at the opposite edges; and at least one of the opposite edges being aligned at an angle δ deviating from said primary propagation direction so that the opposite edges are non-parallel to one another, and wherein δ is related to $\frac{1}{2}$ arcsin $(n \cdot \lambda)/a$ where a is a length dimension of given length units which is equal to that portion of the aperture of the output transducer means acoustically irradiated by the disruptive acoustic wave, λ is a wave length of the acoustic wave in the same length units as a and proceeding at a surface of the substrate body corresponding to a center frequency, and n is a natural number.

4,521,752

PASSIVE TRANSIENT RECORDING SYSTEMS

David A. Gradl, Des Plaines, Ill., assignor to Q-Dot, Inc., Des Plaines, Ill.

Filed Sep. 30, 1982, Ser. No. 431,609
Int. Cl.³ G11C *11/34;* H03K *5/08;* H03H *17/00;* H01P *9/00*
U.S. Cl. 333—165 **13 Claims**



1. An integrated circuit device for recording pulse shaped signal information, comprising a plurality of threshold integrating devices each comprising means for accumulating charge in a potential well upon application of at least one signal thereto in excess of a predetermined threshold potential value, each of said threshold integrating devices having a different threshold potential value, means for receiving a pulsed signal to be analyzed and for applying said signal to be analyzed to each of said plurality of threshold integrating devices, and means for measuring the amount of charge accumulation in the respective potential wells of each of said threshold integrating devices.

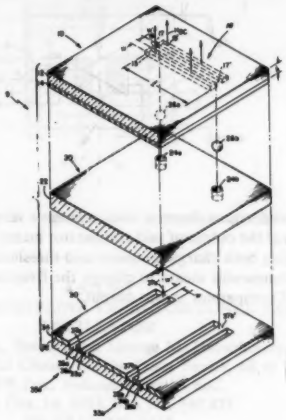
4,521,753

TUNED RESONANT CIRCUIT UTILIZING A FERROMAGNETICALLY COUPLED INTERSTAGE LINE

Ernst F. R. A. Schloemann, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 3, 1982, Ser. No. 446,532
Int. Cl.³ H01P *1/203, 1/218*
U.S. Cl. 333—204 **9 Claims**

1. A magnetically tuned resonant circuit comprising:
(a) input and output transmission lines comprising:
(i) a first dielectric;
(ii) a first ground plane conductor disposed on a first surface of said first dielectric;
(iii) a pair of strip conductors disposed on said first surface of said first dielectric, and dielectrically spaced from said ground plane conductor with one of said strip conductors being an input strip line and the other one being an output strip line;
(b) an interstage transmission line body comprising:
(i) a second dielectric;
(ii) a second ground plane conductor disposed on a surface of said second dielectric; and
(iii) a strip conductor disposed on said surface of said second dielectric and dielectrically spaced from said second ground plane conductor; and



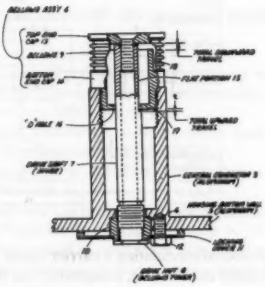
(c) means, including a pair of gyromagnetic resonant bodies, for coupling energy between the input line and output line, with energy fed to the input line being coupled to the interstage line through a first one of the magnetic resonant bodies, said energy propagating along the interstage line and being coupled to the output line through the second one of the magnetic resonant bodies.

4,521,754

TUNING AND TEMPERATURE COMPENSATION ARRANGEMENT FOR MICROWAVE RESONATORS

Joseph C. Ranghelli, Brooklyn, N.Y., and Joseph A. La Bella, Nutley, N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 29, 1983, Ser. No. 527,627
Int. Cl.³ H01P *7/04*
U.S. Cl. 333—224 **31 Claims**



1. A microwave resonator having an adjustable resonant frequency comprising:
an enclosed resonator housing;
a hollow central conductor having one end fastened to a bottom wall of said housing and extending toward a top wall of said housing, the other end of said central conductor being spaced from said top wall and including an

adjustable bellows assembly disposed coaxial of a longitudinal axis of said central conductor; and

a non-rotating, axially movable drive shaft disposed coaxial of said axis within said central conductor, one end of said drive shaft being fastened to said bellows assembly and the other end of said drive shaft being coupled to a drive means disposed in said bottom wall to cause axial movement of said drive shaft to adjust the axial length of said bellows assembly and, hence, the axial length of said central conductor to adjust said resonant frequency;

said drive means including a drive nut threaded onto said other end of said drive shaft and retained in a recess in the outer surface of said bottom wall, rotation of said drive nut axially moving said drive shaft.

4,521,755

SYMMETRICAL LOW-LOSS SUSPENDED SUBSTRATE STRIPLINE

Eric R. Carlson, Fair Haven, and Martin V. Schneider, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 14, 1982, Ser. No. 388,031
Int. Cl.³ H01P *3/06, 3/08*
U.S. Cl. 333—244 **5 Claims**

1. A two-conductor, two-terminal transmission line for radio frequency energy comprising:

a cylindrical channel outer conductor formed within a single, integral mechanically rigid continuous material, at least the surface of the cylindrical channel having a continuous metallic conductive material, a planar line inner conductor having a rectangular cross-sectional shape positioned substantially centrally within the cylindrical channel and extending substantially coextensively with the length of the transmission line to form a rigid, inflexible transmission line having precise dimensional control and symmetry of the geometry within the cylindrical channel wherein field energy is evenly distributed in the air region above and below the planar line inner conductor in the cylindrical channel to provide substantially uniform current densities thereby reducing transmission losses in the transmission line, and

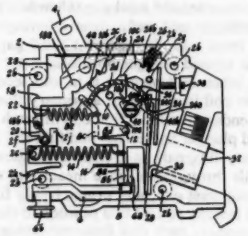
transmission line further comprises laterally opposing grooves having a triangular cross-section extending longitudinally in the cylindrical channel and a rigid dielectric member serving as a substrate for supporting and positioning said inner conductor wherein said inner conductor comprises two strips mounted on opposing surfaces of said dielectric member and the thickness of the inner conductor is between one to four skin depths at the frequency of operation.

4,521,756

CIRCUIT BREAKER HAVING INCREASED CONTACT OPENING VELOCITY AT TRIP OPERATION

Kenneth A. Forsell, Port Washington, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 8, 1983, Ser. No. 559,595
Int. Cl.³ H01H *5/00*
U.S. Cl. 335—21 **19 Claims**



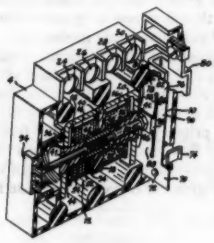
1. An electric circuit breaker comprising a movable contact arm pivotally supported on a latch lever for movement between open and closed contact positions by a pair of springs connected to said contact arm at opposite sides of said contact arm pivotal support for biasing said arm in opposite pivotal directions, operating means having connection with one of said springs and being manually operable for varying the force applied to said arm by said one of said springs to be greater or less than the force applied to said arm by the other of said springs for moving said contact arm in respective opposite rotational directions between said open and closed contact positions, and current responsive trip means normally latching said latch lever and being operable for releasing said latch lever, said springs upon release of said lever providing a unidirectional bias on said latch lever and said contact arm for moving said contact arm to a contact open position.

4,521,757

HIGH SPEED ELECTROMAGNETIC MECHANICAL SWITCH

Jerome K. Hastings, Sussex; James H. Bigelow, and Robert L. Pearson, both of Milwaukee, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 9, 1982, Ser. No. 406,615
Int. Cl.³ H01H *51/24*
U.S. Cl. 335—79 **4 Claims**



1. A high speed electromagnetically actuated electromechanical switch combination, comprising:

a housing;

electrical contact means in said housing, including bistable snap blade means operable between different circuit positions;

a pair of coaxial coils in said housing energizable to create magnetic flux;

a shuttle plunger in said housing axially movable between first and second positions to actuate said snap blade means;

magnetically continuous yoke means in said housing for directing the flux paths of said coils, said yoke means having a first portion spaced from said plunger by a first axial gap when said plunger is in said second position, said yoke means having a second portion spaced from said plunger by a second axial gap when said plunger is in said first position, said yoke means having a third portion spaced from said plunger by a third gap in each of said first and second plunger positions;

such that when said plunger is in said second position and said first coil is energized, a primary flux path is created and extends around said first coil through said yoke means and said plunger and across said first and third gaps, and a secondary flux path is created and extends around both said coils through said yoke means and said plunger and across said first gap, said primary path flux force attracting said plunger to said first position to close said first gap, said secondary path flux force attracting said plunger to remain in said second position; and

such that when said plunger is in said first position and said second coil is energized, a primary flux path is created and extends around said coil through said yoke means and said plunger and across said second and third gaps, and a secondary flux path is created and extends around both said coils through said yoke means and said plunger and across said second gap, said last mentioned primary path flux force attracting said plunger to said second position to close said second gap, said last mentioned secondary path flux force attracting said plunger to remain in said first position, the flux paths from the axial ends of said plunger extending substantially only axially through respective said first and second gaps to said yoke means, said third portion of said yoke means being a central leg extending radially between said coils, said leg having an inner end facing said plunger and separated radially therefrom by said third gap, the axial length of said third gap being no greater than the axial spacing of said coils, the force on said plunger from said primary flux around either said coil always being stronger than the force on said plunger from said secondary flux, preventing residual magnetic latching, such that said plunger moves in either direction responsive to the primary flux in the open gap and actuates said snap blade means without the need for mechanical assistance;

first non-magnetic spacer means axially between said yoke means and said plunger in said first position, the ratio of the axial width of said spacer means to the radial width of said third gap setting the ratio of said second mentioned primary and secondary flux forces such that the primary flux force is greater than the secondary flux force, and the difference therebetween is greater than the mechanical gradient of said snap blade means; and

second non-magnetic spacer means axially between said yoke means and said plunger in said second position, the ratio of the axial width of said second spacer means to the radial width of said third gap setting the ratio of said first mentioned primary and secondary flux forces such that the primary flux force is greater than the secondary flux force, and the difference therebetween is greater than the mechanical gradient of said snap blade means.

4,521,758

ELECTRIC SOLENOID STRUCTURE

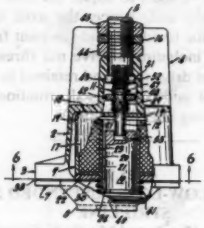
Larry J. Krubsack, Colgate, Wis., assignor to Clum Mfg. Co. Inc., Hartland, Wis.

Filed Aug. 29, 1983, Ser. No. 527,236

Int. Cl.³ H01H *50/02*

U.S. Cl. 335—131 **13 Claims**

10. A solenoid unit for use in a vibrating and shook environment, comprising a plastic molded housing molded in a cup-shape having an open end, said housing having a mounting flange at the open end and a coil section extending from said mounting flange to an inner wall of said coil section and having an integral contact section extending from said coil section, a coil unit located within said coil section and including a cylindrical coil and an armature slidably mounted within said coil,



an outer magnetic can formed of a magnetic material and having an outer based portion located abutting said inner wall of said coil section, said can having a bottom coil plate adjacent said open end, said coil plate and said housing having an interlocking means in the form of a ear and corner to positively support said coil unit and prevent rotational movement of said coil unit within said housing.

4,521,759

ACTIVATING MAGNET

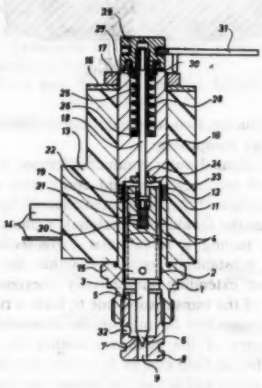
Cristoph Gibas, Neunkirchen, Fed. Rep. of Germany, assignor to bso Steuerungstechnik GmbH, Fed. Rep. of Germany

Filed Apr. 17, 1984, Ser. No. 601,299

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317226

Int. Cl.³ H01F *7/08*

U.S. Cl. 335—255 **8 Claims**



1. An activating magnet comprising:

a magnet housing, a magnet armature movably housed in the magnet housing, and a pole element

a magnetic coil surrounding the magnet housing;

an activating spring biased between the magnet armature and the pole element;

an activating member arranged on the side of the magnet armature opposite the pole element; and

a hand bolt slidably arranged within said magnet housing and connected to the opposite side of the armature as the activating member such that the hand bolt may exert a

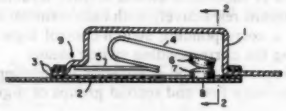
tensile force on the armature and may also be used to slidably release that tensile force from said armature.

4,521,760

MINIATURIZED CIRCUIT BREAKER

Douglas C. Carbone, Wells, and Philip J. Dennis, Cape Elizabeth, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 19, 1983, Ser. No. 533,184
Int. Cl.³ H01H *37/12, 37/54*
U.S. Cl. 337—368 **2 Claims**



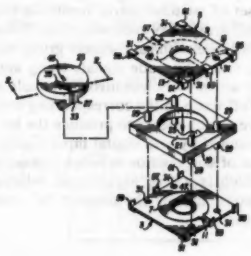
1. A circuit breaker comprising: a two piece metal enclosure, the two metal pieces thereof being electrical terminals and being insulated from each other, one of the metal pieces being a base and the other being a cover, the cover having a step at one end thereof; and a PMB bimetal disposed within the enclosure, the PMB bimetal comprising a cantilever section and a U shaped segment, the U shaped segment having a short leg and a long leg, one end of the cantilever section being fastened to the step, and the other end of the cantilever section being fastened to the short leg of the U shaped segment, and a contact fastened to the long leg of the U shaped segment for making electrical contact with a fixed contact fastened to the base, the cantilever section comprising a high expansion layer and a low expansion layer, the high expansion layer being in contact with the step at the end of the cover.

4,521,761

SMALL OUTLINE POTENTIOMETER

Edward W. Welch, Dallas, Pa., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Feb. 17, 1984, Ser. No. 581,152
Int. Cl.³ H01C *10/34, 10/30*
U.S. Cl. 338—174 **14 Claims**



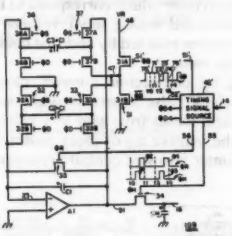
1. A potentiometer comprising:
a first substrate having a conductive layer formed thereon;
a second substrate having a resistive layer formed thereon, the first and second substrates being arranged in a spaced-apart facing relationship with respect to each other;
a circular disk-like rotor disposed between the first and second substrates, the rotor including a radial opening formed therein; and
a one-piece conductive wiper formed from a conductive resilient material disposed in the rotor opening, the wiper including a pair of arms having a series of parallel resilient members formed thereon extending above and below the plane of the rotor with the resilient members of one arm arranged to contact the conductive layer of the first substrate and the resilient members of the other arm arranged to contact the resistive layer of the second substrate.

4,521,762

INTEGRATABLE D/A CONVERTER

Christopher W. Kapral, San Carlos, Calif., assignor to GTE Automatic Electric Laboratories, Incorporated, Phoenix, Ariz.

Division of Ser. No. 296,733, Aug. 27, 1981, Pat. No. 4,451,820. This application Dec. 20, 1982, Ser. No. 455,787
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **12 Claims**



1. The method of converting a digital input word, corresponding to a binary number and having an even number of bits, to an associated analog signal comprising the steps of:
electrically connecting one and other sides of a first capacitor to the inverting input terminal and the output terminal of a differential input operational amplifier means;
electrically connecting the non-inverting input of the amplifier to a ground reference voltage for impressing a virtual ground potential on its inverting input terminal; the amplifier and first capacitor, which is a feedback capacitor, operating as a voltage source;
sequentially impressing one of a prescribed voltage from a voltage source and the ground reference voltage on a bus line for a binary one and zero, respectively, in the associated bit position in the digital word; and
electrically connecting one and other sides of one of second and third capacitors, each having a capacitance equal to that of the first capacitor, to ground and the bus line for sampling the bus voltage, and electrically connecting the one and other sides of the other one of the second and third capacitors to associated sides of the first capacitor for redistributing the charge-voltages on the first capacitor and the other one of the second and third capacitors for each bit of the digital input word.

4,521,763

A-D CONVERTER AND METHOD OF A-D CONVERSION

Yutaka Murao, Yokohama, Japan, and Taira Nishizono, West Bloom Field, Mich., assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 119,023, Feb. 6, 1980, abandoned, which is a continuation of Ser. No. 918,605, Jun. 23, 1978, abandoned. This application Sep. 17, 1982, Ser. No. 419,571
Claims priority, application Japan, Jun. 24, 1977, 52-75004
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **9 Claims**

3. An A-D conversion method using a V-T converter wherein the voltage level of an input signal and the time period of an oscillated output signal have a linear relationship, and comprising the steps of:
(A) loading a first counter with a specific value,
(B) supplying a first analog input voltage signal of a first voltage level V_L to said V-T converter,

(C) counting, by said first counter, first pulses issued from said V-T converter which correspond to the voltage level V_L of the first analog input voltage signal until the number of pulses counted by said first counter has come to said specific value,

(D) counting, by a second counter, clock pulses issued from a clock pulse generator while said first counter counts first pulses from said V-T converter,

(E) loading the number n_L of clock pulses counted by said second counter into a central processing unit,

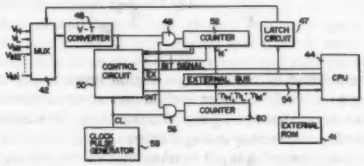
(F) loading said first counter with said specific value;

(G) supplying a second analog input voltage signal of a second voltage signal V_H to said V-T converter,

(H) counting, by said first counter, second pulses issued from said V-T converter which correspond to the voltage level V_H of the second analog input voltage signal until the number of pulses counted by said first counter has come to said specific value,

(I) counting, by said second counter, clock pulses issued from the clock pulse generator while said first counter counts second pulses from said V-T converter,

(J) loading the number n_H of clock pulses counted by said second counter into said central processing unit,



(K) loading said first counter with said specific value,

(L) supplying an analog input voltage signal of an unknown voltage level V_M to be measured to said V-T converter,

(M) counting, by said first counter, third pulses issued from said V-T converter which correspond to the unknown voltage level V_M of the analog signal to be measured until the number of pulses counted by said first counter has come to said specific value,

(N) counting, by said second counter, clock pulses issued from the clock pulse generator while said first counter counts third pulses from said V-T converter,

(O) loading the number n_M of clock pulses counted by said second counter into said central processing unit, and

(P) carrying out the equation

$$M=(n_M-n_L)/(n_H-n_L)\times 2^n$$

by the central processing unit to calculate the digital value M converted from the unknown voltage level V_M on the basis of the pulse information stored in the central processing unit where, 2^n is a full scale of the converted digital value.

4,521,764

SIGNAL-CONTROLLABLE ATTENUATOR EMPLOYING A DIGITAL-TO-ANALOG CONVERTER

David P. Burton, Limerick, Ireland, assignor to Analog Devices Incorporated, Norwood, Mass.

Continuation of Ser. No. 43,174, May 29, 1979, abandoned. This application Dec. 31, 1981, Ser. No. 336,288

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **8 Claims**

1. A digital-to-analog converter providing an attenuation factor varying in accordance with a logarithmic function, comprising:

a resistor network circuit having input and output terminals;

said resistor network circuit comprising a number N of successive stages of progressively differing attenuation values and each arranged to be connected into or out of the circuit to control the total attenuation between said input and output terminals;

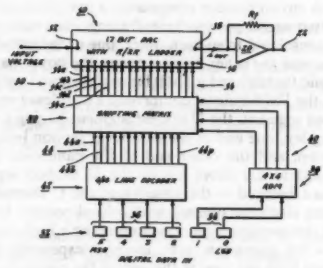
said input terminal being connected to the attenuation stage at one end of said successive stages and said output terminal being connected to the attenuation stage at the other end of said successive stages;

means for applying an input signal to said input terminal;

switch means for each of said network stages, respectively, to provide for connecting the corresponding stage into or out of said resistor network circuit between said input and output terminals, to effect attenuation of said input signal in accordance with the selected stages which are switched in between said input and output terminals;

an array of N successive switch control terminals for said switch means respectively with each terminal arranged to receive a corresponding switch-control logic signal for operating the corresponding switch means;

means to receive a digital attenuation-controlling input signal comprising first and second groups of digital control signals;



logic-signal-generating means responsive to said first group of digital control signals and operable to develop a corresponding set of logic signals for defining an n-bit code where n is smaller than N; and

shift-position-controlling means responsive to said second group of digital control signals for directing to an n-numbered sequential set of said switch-control terminals the respective individual binary signals of an n-bit code signal as defined by said set of logic signals, said n-numbered sequential set of switch-control terminals being selected from the total array of N successive switch-control terminals in accordance with said second group of digital control signals, said n-bit code signals being applied to said n-numbered set of switch-control terminals and controlling the on/off status of the corresponding n-numbered set of successive switch means to produce the level of attenuation commanded by said digital input signal;

the attenuation of said resistor network providing a transfer function which is a true logarithmic relationship to an accuracy determined by the number "n" preselected for the apparatus.

4,521,765

CIRCUIT AND METHOD FOR REDUCING NON-LINEARITY IN ANALOG OUTPUT CURRENT DUE TO WASTE CURRENT SWITCHING

Anthony D. Wang, and Donald L. Brumbaugh, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 421,506, Sep. 22, 1982, Pat. No. 4,468,652, which is a continuation of Ser. No. 250,867, Apr. 3, 1981, abandoned. This application May 4, 1983, Ser. No. 491,600

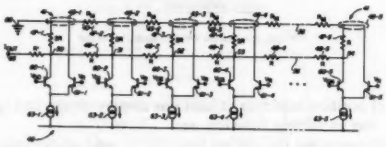
Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **13 Claims**

1. In a circuit for converting a multiple bit digital word to an analog current corresponding to a digital number represented by said digital word, a bit circuit comprising in combination:

(a) first current source means for producing a first current;

(b) a first resistor having first and second terminals;
(c) a second resistor having first and second terminals;
(d) a first transistor having a collector, a base responsive to a first bit of said digital word, and an emitter;
(e) a second transistor having a collector, a base having a first reference voltage thereon, and an emitter;
(f) a reference current conductor having a shared node and a distributed resistance on one side of said shared node, said reference current conductor having a second reference voltage thereon;
(g) means for coupling said first terminal of said first resistor and said collector of said second transistor to said shared node;
(h) means for coupling said second terminal of said first resistor and said first terminal of said second resistor to

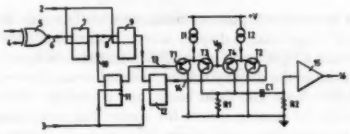


said collector of said first transistor and means for resistively coupling said collector of said first transistor to an output conductor for conducting said analog current; and
(i) means for coupling said first current source means to said emitters of said first and second transistors, said first transistor being responsive to the logic state of said first bit to steer said first current into circuitry including said first and second resistors in order to cause said first current to contribute to said analog current if said first bit is at a first logic level, said first transistor also operating to steer said first current through said second transistor, said shared node, and said distributed resistance if said first bit is at a second logic level, whereby all or at least a substantial portion of said first current flows through said distributed resistance regardless of the logic state of said first bit.

4,521,766
CODE GENERATOR

Michael G. Vry, East Grinstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1982, Ser. No. 436,206
Claims priority, application United Kingdom, Nov. 2, 1981, 8132929
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **6 Claims**

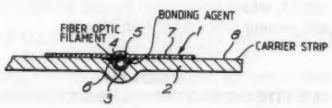


1. A code generator for producing a transmission code in response to an input serial binary code having a bit period T, the code generator comprising means for generating a signal having a first value for a period T/2 located centrally in the bit period in response to a bit of one binary state, means for generating a signal having a second value for the period T/2 in response to a bit of the other binary state, means for generating a signal having the second value during the interval between the T/2 periods of successive bits when two consecutive bits are of the one binary state, means for generating a signal having the first value during the interval between the T/2 periods of successive bits when two consecutive bits are of the other binary state, and means for producing a signal having a value intermediate the first and second values during the interval between the T/2 periods of successive bits when two consecutive bits are of different binary states.

4,521,767
COMPOSITE STRIP

Richard F. Bridge, Coach House, Windmill La., Burlesdon, Hampshire, England

Continuation of Ser. No. 967,645, Dec. 8, 1978, Pat. No. 4,307,386. This application Jun. 18, 1981, Ser. No. 274,723
Claims priority, application United Kingdom, Dec. 9, 1977, 51444/77; May 3, 1978, 40412/77
The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.
Int. Cl.³ G08B *13/18*; G02B *5/14*
U.S. Cl. 340—555 **12 Claims**

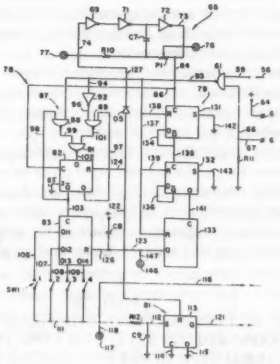


1. A composite strip comprising a metal carrier strip having a main portion, means forming a longitudinal groove in said main portion, a plurality of metal barbs or serrations which extend from said main portion and are integral therewith, a fibre-optic filament disposed in said groove, and an adhesive strip applied to the main portion only of the carrier strip so as to overlie said groove and cover the fibre-optic filament without covering said barbs or serrations.

4,521,768
INTRUSION DETECTOR

Ilan Haran, and Dan Haran, both of Ramat Gan, Israel, assignors to Elsec Electronic Security Systems Ltd., Givataim, Israel

Filed Apr. 8, 1982, Ser. No. 366,558
Int. Cl.³ G08B *13/00*
U.S. Cl. 340—566 **1 Claim**



1. An intrusion detection system for reliably detecting intrusions into an enclosed area comprising:
detecting means for providing signals indicative of intrusions into said enclosed area;
means for determining significant signals indicative of intrusions above a fixed threshold level;
first means for measuring the time length of each of said

significant signals, and for accumulating the measured time lengths of successive significant signals;

means responsive to the accumulated time lengths in said first means reaching a first preselected time length for providing an intrusion-indicating signal;

second means for measuring the time length during which no significant signals are received;

means connected to said second means for resetting said second means, so that the time length measured thereby is reset to zero upon receipt of a significant signal; and

means interconnecting said first and second means for resetting said first means, so that the time length accumulated therein is reset to zero when the measured time length in said second means reaches a second preselected time length, whereby an intrusion-indicating signal is provided only when the accumulated time lengths in said first means reach said first preselected time length prior to the time length during which no significant signals are received, which is measured by said second means reaching said second preselected time length.

4,521,769

DEVICE FOR DETECTING THE FAILURE OF A SENSOR

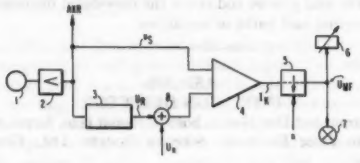
Ingo Dudeck, Weinstadt, and Jürgen Schenk, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,658

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211644

Int. Cl.³ G01L *23/22*

U.S. Cl. 340—635 **6 Claims**



4. A device for detecting failure of a sensor, the sensor being for installation on a rotating machine element,

means for smoothing and rectifying a sensor output signal having a first time period,

means for comparing the sensor output signal with the smoothed and rectified signal to produce a comparator output signal when the sensor output signal exceeds the smoothed and rectified signal,

one-shot multivibrator means receiving the comparator output for producing an output pulse having a second time period exceeding the first time period, and

means generating an output signal when the output pulse vanishes in response to failure of the sensor for actuating at least one of a control device and an alarm device.

4,521,770

USE OF INVERSIONS IN THE NEAR REALTIME CONTROL OF SELECTED FUNCTIONS IN INTERACTIVE BUFFERED RASTER DISPLAYS

James R. Rhyne, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1982, Ser. No. 412,481

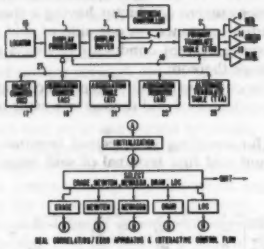
Int. Cl.³ G09G *1/28*

U.S. Cl. 340—703 **7 Claims**

1. A method for editing a display of multicolored objects exhibited by an interactive refresh buffer raster driven display system comprising the steps of:

(a) forming a first concordance of display position and object identity and storing said first concordance in the refresh buffer;

(b) forming a second concordance of object identity and color attributes and storing said second concordance in auxiliary memory;



(c) position selecting at least one display object and specifying an editing function; and

(d) executing the editing function by way of dynamic alteration of those attributes in the second concordance accessed through the position selection and object identity of the first concordance.

4,521,771

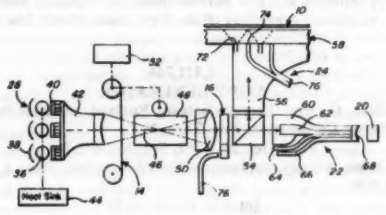
COMBINED STATIC AND DYNAMIC IMAGE DATA DISPLAY SYSTEM

Michael J. Alton, Cupertino, Calif., assignor to Omni Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 100,705, Dec. 4, 1979, abandoned. This application Feb. 24, 1982, Ser. No. 352,033

Int. Cl.³ G09G *3/00, 3/36*

U.S. Cl. 340—705 **17 Claims**



1. In a visual display data-independent system having a source of image data, a display screen, a source of illumination from which a light beam is emitted to transmit images from the data source to the display screen, sensing means for extracting optical data from said light beam, and computer means interfaced with the sensing means for controlling operation of the source of image data, said image data source including a static film and a LCD matrix through which the light beam passes in sequence along a common optical axis, the improvement comprising optical fiber means operatively positioned relative to said source of illumination for receiving said light beam along said common optical axis extending through the source of image data, means for projecting said images, transmitted by the light beam along said common optical axis, to said display screen, means for transmitting portions of said images to the sensing means independently of said projection of the images to the display screen, said LCD matrix having image transmitting dots with predetermined spacing therebetween less than the image resolution of the static film, including resolution compensating optical fiber means operatively positioned along said common optical axis between the LCD matrix and the

sensing means, said resolution compensating optical fiber means including a matrix of optical fibers more closely spaced than said predetermined spacing between the image transmitting dots of the LCD matrix, whereby scanning of images formed by the static film through the LCD matrix and the sensing means is performed at resolutions comparable to said image resolution of the static film.

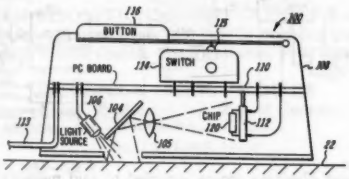
4,521,772
CURSOR CONTROL DEVICE

Richard F. Lyon, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 296,947, Aug. 28, 1981,. This application Jan. 13, 1983, Ser. No. 457,805

Int. Cl.³ G09G 1/00

U.S. Cl. 340—710 **58 Claims**



1. In a cursor control device to provide an output indicative of the amount and direction of relative of the device, said device including

a housing,

a planar array pattern,

said housing moveable relative to said pattern,

illuminating means mounted in said housing to direct radiation to a portion of said pattern,

sensor array means mounted in said housing to receive and detect radiation reflected from said illuminated pattern portion, said array means comprising a plurality of sensor cells and circuit means coupled to each of said sensor cells to provide a plurality of cell outputs each capable of representing whether a cell has sensed a predetermined quantity of radiation received from said pattern portion and providing a corresponding output signal the output signal of each of said cells coupled to at least one neighborhood cell to permit the alteration of the output of said coupled cells whereby said pattern portion is recognized as one of a limited plurality of predetermined patterns.

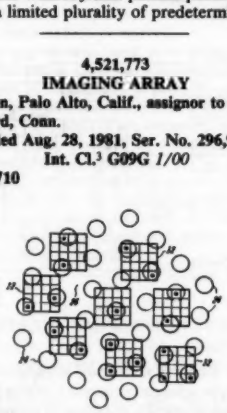
4,521,773
IMAGING ARRAY

Richard F. Lyon, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 28, 1981, Ser. No. 296,947

Int. Cl.³ G09G 1/00

U.S. Cl. 340—710 **63 Claims**



1. An imaging array comprising a planar array of optical sensor cells each capable of sensing and converting optical radiation into an electrical output signal when any one of said cells has sensed a predetermined quantity of radiation, a field of contrasting features detectable by said sensor array, the difference in the spatial frequency of said contrasting features in said field relative to the spatial relation of said cells productive of an intermediary pattern comprising at least one detected contrasting feature from said field, circuit means coupled to each of said cells to receive said output signals with the output signals of each of said cells coupled with several of said neighboring cells in said array to alter the output of said neighboring cells resulting in the recognition of said intermediary pattern as being one of a limited plurality of predetermined such patterns.

4,521,774
RASTER CRT HAVING BALANCED PEL DISTRIBUTION FOR FLICKER REDUCTION

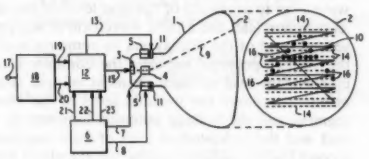
Alan S. Murphy, Chandler's Ford, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1981, Ser. No. 322,819

Claims priority, application European Pat. Off., Nov. 28, 1980, 80304653.1

Int. Cl.³ G09G 1/16

U.S. Cl. 340—745 **6 Claims**



1. The method of reducing perceived flicker in a CRT display device comprising an electron gun, a display screen, horizontal and vertical deflection means operable to cause an electron beam from said gun to be scanned over said screen progressively in successive basic raster scan lines in successive fields of a predetermined basic raster, and modulation means operable in response to input video information defining a two-dimensional image to modulate the brightness of the beam scanning to produce individual visible picture elements (pels) on the screen, a representation of said two dimesional image being formed thereby as the combination of pels produced during two successive field scans of the basic raster, characterized in

providing auxiliary deflection means operable to deflect the beam transversely of the line scan direction of the basic raster during each basic raster line scan thereof to a currently selected one of a pair of adjacent image scan lines on the screen corresponding to the current basic raster scan line, the image scan lines corresponding to the totality of the basic raster scan lines being spaced apart on the screen and constituting an image raster of twice the line density of said predetermined basic raster,

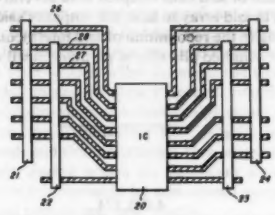
determining in which of the two successive field scans the pels representing selected portions of said image are to be displayed,

and controlling said auxiliary deflection means in accordance with the physical distribution of successive pels to be generated with respect to the timing of generation of pels by said modulation means whereby any accumulative pel imbalance between the two fields as a result of the pel distribution is minimized.

4,521,775
METHOD OF OPERATING A STACKED DISPLAY

Robert T. Noble, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 198,073, Oct. 17, 1980, abandoned. This application Jan. 14, 1983, Ser. No. 458,084
Int. Cl.[3] G09G *3/36*
U.S. Cl. 340—784 1 Claim



1. A method of operating a stacked display having two display levels in optical series, each level including a plurality of electro-optical segments having an opagueing threshold and being arranged so each segment is coupled to an independent lead and each of the segments of a selected level is coupled to a common lead and comprising the steps of:

applying during a first interval, a first waveform to each electro-optic segment via the independent lead, a second waveform to segments of the first level of the display via its common lead and a third waveform to segments of the second level of the display via its common lead, wherein the voltage potential between the common lead and the independent lead of each segment of said first level is maintained above the treshold level of the electro-optic segment and the voltage potential between the common lead and the independent lead of each segment of said second level is reduced below the threshold level of the electro-optic segment to thus activate said first level and deactivate said second level; and

applying, during a second interval, the first waveform to each electro-optic segment via the independent lead, the second waveform to segments of the second level of the display via its common lead and the third waveform to segments of the first level of the display via its common lead, wherein the voltage potential between the common lead and the independent lead of each segment of said second level is maintained above the threshold level of the electro-optic segment and the voltage potential between the common lead and the independent lead of each segment of said first level is reduced below the threshold level of the electro-optic segment to thus activate said second level and deactivate said first level.

4,521,776
RADIO PAGING DEVICE INCLUDING APPARATUS FOR PREVENTING UNDESIRED DEVICE TURN-OFF

George W. Smoot, Sunrise, and Philip P. Macnak, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1982, Ser. No. 432,229
Int. Cl.[3] G08B *5/22*
U.S. Cl. 340—825.44 7 Claims

1. A radio paging device comprising:

receiving means, for receiving radio frequency selective calling message signals transmitted over a communications channel;

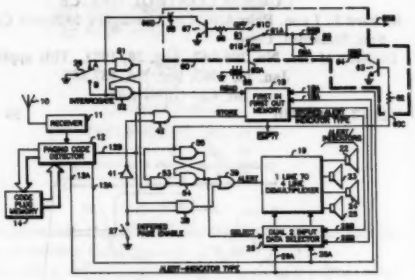
decoding means, coupled to said receiving means, for detecting when selective calling message signals intended for said device are received;

memory means, coupled to said decoding means, for storing said selective calling message signals;

interrogation means, coupled to said memory means, for interrogating said memory means upon command of the user of said paging device to provide output of the selective calling messages signals stored in said memory means in a form understandable to the user;

power supply means, for providing power to said radio paging device;

user actuable switching means, operatively coupled to said power supply means, for selectively switching power to said paging device;



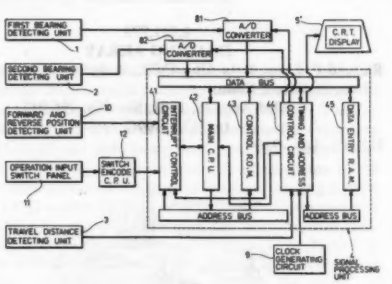
memory checking means, coupled to said memory means and said switching means, for determining if any unread selective calling message signals remain in said memory means when the user attempts to turn off the device, and

turn off prevention means, coupled to said memory checking means and said switching means, for preventing turn off of said device if said memory checking means determines that unread selective calling message signals remain in said memory means when the user attempts to turn off the device.

4,521,777
APPARATUS FOR VISUALLY INDICATING THE CURRENT LOCATION OF AN AUTOMOTIVE VEHICLE

Yukinobu Nakamura; Katsutoshi Tagami, and Tsuneo Takahashi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1982, Ser. No. 408,274
Claims priority, application Japan, Aug. 21, 1981, 56-130942
Int. Cl.[3] G08G *1/12*
U.S. Cl. 340—995 1 Claim



1. A current location indicating apparatus for use in an automotive vehicle wherein a current location of said automotive vehicle is arithmetically obtained in terms of two-dimensional coordinates by a signal processing unit on the basis of the outputs from a travel distance detecting unit and a bearing detecting unit, and the current location of said vehicle is visually indicated on the screen of a display from the thus-obtained

data in connection with the current location thereof, which comprises, in operative combination:

first bearing detecting means including an earth magnetism sensor as a primary component thereof;

second auxiliary detecting means including a rate type gyroscope or the like; and

signal processing means for continuously monitoring the output from said first bearing detecting means in comparison with the operating state of said second auxiliary bearing detecting means to determine whether or not said earth magnetism sensor of said first bearing detecting means is under the influence of external disturbances for a short period so that the output of said first bearing detecting means can be immediately corrected accordingly, while said vehicle is in motion.

4,521,778

HIGH-RESOLUTION, COHERENT PULSE RADAR

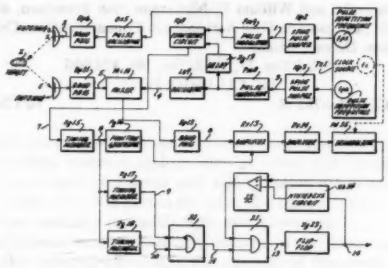
Udo Knepper, Langenargen, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Feb. 9, 1982, Ser. No. 347,109

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107444

Int. Cl.³ G01S *13/10*

U.S. Cl. 343—13 R **18 Claims**



1. In a pulse radar procedure for near distance ranges down to the meter range, including a scanning procedure performing time expansion, further including, generating two higly stable base-band pulse trains (1,3) one of which is processed into transmitter pulses (2) and the other, which has a somewhat lower pulse repetition frequency, into scanning pulses (4),

the improvement which comprises

(a) converting both base-band pulse trains (1,3) into microwave pulse trains (2,4) of which the carrier frequency initial phase is determined in time by one of the controlling base-band pulses in such manner the two microwave pulse trains (2,4) always are coherent with respect to the carrier frequency thereof by means of their associated pulse repetition frequency, and

(b) multiplying the received echo signals (5) in a microwave mixer (Mi 10) by the microwave scanning pulses (4), thereby forming time-expanded intermediate frequency signals (6) which are selectively reinforced and demodulated into video signals (12).

4,521,779

PULSE COMPRESSION SYSTEM

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1980, Ser. No. 143,399

Int. Cl.³ G01S *7/30, 13/52*

U.S. Cl. 343—17.2 PC **10 Claims**

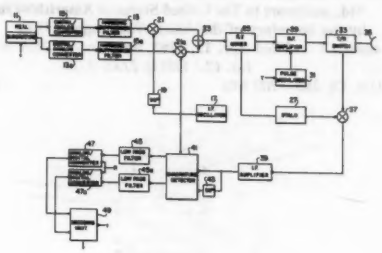
1. A decoding device comprising:

means for providing a decoding phase shift $-\Delta\phi_{k,p}$ to the signal elements of a transmitted phase-coded signal reflected from a reflector to examine a range interval corresponding to the area containing the reflector, wherein

$$\Delta\phi_{k,p}=-(2\pi/N)[k-\tfrac{1}{2}(N-1)][p-\tfrac{1}{2}(N-1)]$$

is the phase of the pth code element in the kth subgroup and

k=0, 1, 2, . . . , N−1



p=0, 1, 2, . . . , N−1, and

N is an even integer; and

means for adding the phase-shifted signal elements at the same time to produce a narrow pulse with an accompanying increase in effective peak signal.

4,521,780

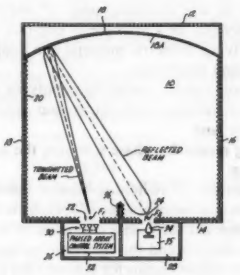
TARGET SIMULATION SYSTEM

Fritz K. Preikschat, 16020 Lake Hills Blvd., Bellevue, Wash. 98008

Filed Oct. 19, 1981, Ser. No. 312,800

Int. Cl.³ G01S *7/40*

U.S. Cl. 343—17.7 **22 Claims**



1. A target simulation system for testing target seekers, said system comprising:

a reflector having a substantially ellipsoidal reflecting surface;

an array of transmitting elements, the center of said array being located at first focal point of said ellipsoidal reflecting surface;

a phased array control system for causing said array to transmit toward said ellipsoidal reflecting surface at least one beam of radiation whose beam axis has a predetermined angle relative to said array, whereby said transmitted beam is reflected by said ellipsoidal reflecting surface to result in a corresponding reflected beam whose beam axis passes through a second focal point of said ellipsoidal reflecting surface; and,

means for mounting the target seeker to be tested so that a receiving means of the target seeker is located at said second focal point of said ellipsoidal reflecting surface, whereby said reflected beam simulates radiation coming from a target at a predetermined angle relative to the

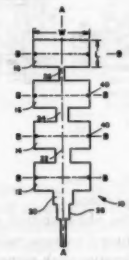
target seeker that is defined by said predetermined angle of the corresponding transmitted beam.

4,521,781

PHASE SCANNED MICROSTRIP ARRAY ANTENNA

Morris Campi, and Arthur R. Sindoris, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1983, Ser. No. 484,326
Int. Cl.³ H01Q *1/38, 3/26*
U.S. Cl. 343—700 MS **11 Claims**



1. A microstrip array antenna, comprising:
an electrically conductive reference surface;
a layer of dielectric material overlying said reference surface;
a plurality of electrically conductive, spaced apart, radiator elements overlying said layer of dielectric material, each radiator element including at least one radiating edge, and each radiator element having an effective dimension transverse to said radiating edge of approximately one-half wavelength, or a multiple of one-half wavelength, in the underlying dielectric material at a predetermined antenna operating frequency;
microwave supply means for supplying microwave energy to each radiator element at said antenna operating frequency; and
scanning means for phase scanning the antenna beam, comprising:
a plurality of switching means associated respectively with said radiator elements, each switching means being connected between a null point of the associated radiator element and the reference surface, and
switch control means for periodically closing and opening said plurality of switching means.

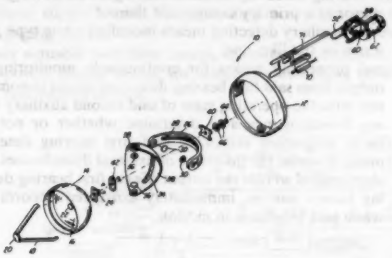
4,521,782

TARGET SEEKER USED IN A POINTER AND TRACKING ASSEMBLY

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed May 5, 1983, Ser. No. 491,898
Int. Cl.³ H01Q *3/08*
U.S. Cl. 343—765 **8 Claims**

1. An improved target seeker used in a pointer and tracking assembly, the seeker comprising:
a primary sensing element attached to a movable head, the movable head having a stylus mounted thereon;
a secondary sensing element attached to the front of the head for focusing the electromagnetic energy received onto a detector, the detector attached to the movable head and centered thereon;
an X drive plate oriented in an X axis, the ends of the plate attached to part of a fixed frame of the assembly;
a Y drive plate oriented in a Y axis, the ends of the plate attached to part of a fixed frame of the assembly, the stylus engaged by the X and Y drive plates for moving the head;



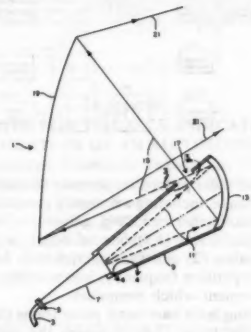
means for rotating the X drive plate around an X axis; and
means for rotating the Y drive plate around a Y axis.

4,521,783

OFFSET MICROWAVE FEED HORN FOR PRODUCING FOCUSED BEAM HAVING REDUCED SIDELOBE RADIATION

Lawrence G. Bryans, Mountain View; Kenneth R. Goudey, Sunnyvale, and William F. Nickerson, San Francisco, all of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Sep. 27, 1982, Ser. No. 424,946
Int. Cl.³ H01Q *19/13*
U.S. Cl. 343—781 R **10 Claims**



1. An apparatus for producing a focused beam of high-frequency electromagnetic radiation propagating along an axis, comprising in combination:
an electromagnetic horn radiator for producing in response to an input source of electromagnetic energy a first relatively broad beam of electromagnetic radiation propagating away from said horn radiator along a first axis;
a curvilinear electromagnetic reflector located spaced from said horn radiator along said first axis, said reflector being dimensioned and positioned to intercept said relatively broad beam of radiation;
beam-edge defining means extending between said horn radiator and said reflector for limiting and confining said first beam and for preventing the propagation of energy along paths outside the outer edges of said reflector;
said beam-edge defining means being provided with an aperture therethrough in a wall portion thereof between said horn and reflector;
said reflector being shaped and positioned to redirect radiation propagating along said first axis into a sharply defined beam propagating along a second axis extending from said

reflector to said aperture, and to bring said radiation to a focus in the region of said aperture.

4,521,784

GROUND-PLANE ANTENNA WITH IMPEDANCE MATCHING

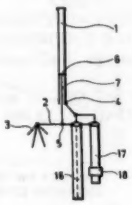
Mihaly Nemet, Budapest, Hungary, assignor to Budapesti Radiotechnikai Gyar, Hungary

Filed Sep. 10, 1982, Ser. No. 416,702

Claims priority, application Hungary, Sep. 23, 1981, 2744/81

Int. Cl.³ H01Q *1/48*

U.S. Cl. 343—846 **5 Claims**



1. Improved ground-plane antenna arrangement comprising:
a vertical resonant quarterwave radiating rod having an upper end and a lower end, said radiating rod being provided at least in part in the form of a hollow tube extending vertically upwardly from said lower end,
an antenna base mechanically coupled to said lower end of the radiating rod and in the operational frequency, said base being electrically isolated from said lower end,
a plurality of counterweight resonant rods extending from and connected with said antenna base and providing a virtual ground-plane for the radiating rod in the height of said base,
an earthing rod having an upper end and a lower end, said earthing rod extending centrally in said hollow tube and being short-circuited at the upper end of said earthing rod with said tube, whereby a short-circuited coaxial line section shorter than the quarterwavelength is formed,
a pair of input terminals adapted for respective connection to a coaxial feeding line having an inner conductor and an outer conductor, said terminals being respectively formed by said lower end of the radiating rod and by said base,
a coaxial open line section having an inner conductor and an outer conductor, and further having an open end and a connected end, said connected end being connected across said input terminals in such a way that the outer conductor is connected to said base and the inner conductor is connected to said lower end of the radiating rod,
said open line section forming an extension of said short-circuited line section and therewith providing a resonant combined line section such that the combined electrical length of the two line sections thereof is in the tolerance range of ±25% of the quarterwavelength,
the input terminals forming tapping points of the so obtained resonant combined line section, whereby the susceptance of the combined line section measurable in the tapping point is capable of at least partially compensating the reactive component of the input impedance of the antenna.

4,521,785

IMAGE FORMING DEVICE

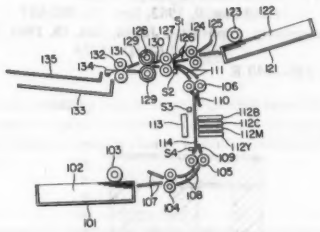
Yohji Matsufuji, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,854

Claims priority, application Japan, Jun. 21, 1982, 57-107246; Jun. 21, 1982, 57-107247; Jun. 21, 1982, 57-107248; Jun. 21, 1982, 57-107249

Int. Cl.³ G01D *9/00*

U.S. Cl. 346—25 **3 Claims**



1. An image forming system comprising:
a recording medium having a substrate and an ink receptive layer laminated on said substrate so that said reception layer can be peeled off from said substrate;
a transfer-receiving member having a substrate and an adhesive layer provided on at least one surface of said substrate;
means for recording an ink image on said ink receptive layer of said recording medium;
means for feeding said recording medium to said recording means;
means for pressure contacting said recording medium with said transfer-receiving member to laminate them;
means for feeding said transfer-receiving member to said pressure contacting means; and
means for separating said recording medium from said transfer-receiving medium with said ink receptive layer adhered to said transfer receiving member.

4,521,786

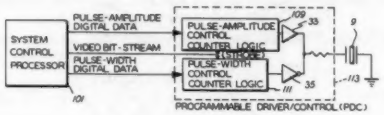
PROGRAMMABLE DRIVER/CONTROLLER FOR INK JET PRINTHEADS

Lee L. Bain, Arlington, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 20, 1982, Ser. No. 422,404

Int. Cl.³ G01D *15/18*; H01L *41/10*

U.S. Cl. 346—140 R **2 Claims**



1. A method of controlling a drop-on-demand ink jet ejector which utilizes an electromechanical transducer to eject droplets in response to a drive pulse which includes the steps of:
(a) providing a supply source of charging potential;
(b) providing charging control means for connecting said supply source of charging potential to said electromechanical transducer, the electromechanical transducer drive pulse having a charging rise time curve due to the capacitance of the electromechanical transducer and the resistance of the charging control means;
(c) applying a charging control pulse to said control means to initiate charging said electromechanical transducer; and

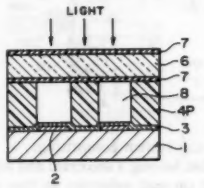
(d) terminating said charging control pulse to said control means during the drive pulse charging rise time so that the amplitude of the potential to which the electromechanical transducer is charged is a function of the width of said charging control pulse, and wherein said charging control pulse width is digitally programmable.

4,521,787

INK JET RECORDING HEAD

Masami Yokota, Hiratsuka; Hiroshi Sugitani, Machida, and Tadayoshi Inamoto, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,687
Claims priority, application Japan, Jun. 18, 1982, 57-103723
Int. Cl.³ G01D 15/16
U.S. Cl. 346—140 R 6 Claims



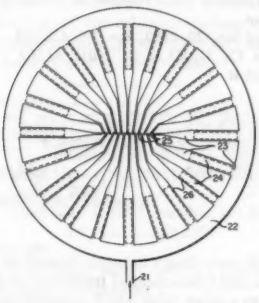
1. An ink jet recording head, comprising a substrate, and a cured film of a photosensitive resin defining ink pathways and a covering over said pathways wherein said covering comprises a flat plate made of a UV-light transmitting material having respective cured films of photosensitive resin adhered on both surfaces thereof.

4,521,788

INK JET PRINTING HEAD

Yoshiaki Kimura, Hachioji; Taketo Nozu, Hino, and Yasuhiko Tanaka, Fuchu, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Dec. 22, 1982, Ser. No. 452,097
Claims priority, application Japan, Dec. 26, 1981, 56-213901
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 7 Claims



1. An ink-jet printing head for an impulse jet type ink-jet printing apparatus, the printing head comprising:

at least one arcuately-shaped common ink-chamber disposed substantially parallel to a reference plane;

a plurality of ink flow channels connected at one end to said common ink-chamber and extending radially from the inner circumference of said common chamber and substantially parallel to said plane, said common ink-chamber curving toward said ink flow channels and ink being supplied to said ink flow channels from said common ink-chamber;

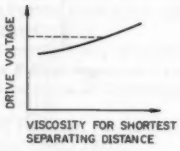
each of said ink flow channels including (a) a nozzle from which ink is to be ejected dropwise, disposed substantially perpendicularly to said plane and connected to the end of each said ink flow channel opposite to the end connected to said common ink-chamber, (b) a pressure chamber, and (c) a piezoelectric-crystal element disposed on at least one surface of said pressure chamber and having a length to width ratio in the range of not less than 2 to 1 and not greater than 20 to 1.

4,521,789

INK VISCOSITY REGULATION FOR INK JET PRINTER

Koichiro Jinnai, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,491
Claims priority, application Japan, Jul. 5, 1982, 57-116642
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 3 Claims



1. An ink viscosity regulation apparatus for an ink jet printer in which an electrostrictive vibrator is driven to eject ink from a nozzle of a head so that the ink is separated into a droplet to print out a dot on a recording medium, said apparatus comprising:

means for varying a drive voltage applied to the vibrator;

means for detecting a specific level of the drive voltage at which the droplet is separated from the ink at a shortest distance; and

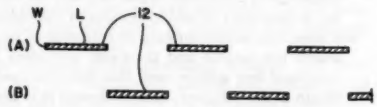
means for comparing said detected drive voltage level with a predetermined reference voltage level and, when the detected level is higher than the reference level, generating a command signal for diluting the ink and, when the detected level is lower than the reference level, generating a command signal for causing the ink to keep a viscosity thereof unchanged.

4,521,790

ELECTROSTATIC PRINTER OF VIDEO PICTURES WITH GREY TONES

Emmanuel M. Allard, Paris, France, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 27, 1982, Ser. No. 453,534
Claims priority, application France, Mar. 24, 1982, 82 05355
Int. Cl.³ G01D 15/06
U.S. Cl. 346—154 10 Claims



1. An electrostatic grey tone printing device having a writing head for use with a dielectric paper, said printing device comprising;

recording electrodes on the writing head having a substantially elongated cross-sectional geometry, such that a

width dimension is significantly less than a length dimension, said recording electrodes having a length, L, and a width, W;

complementary electrodes operatively associated with said recording electrodes and having a predetermined cross-sectional geometry;

means for applying a first voltage of one polarity to one or more recording electrodes;

means for applying a second voltage of opposite polarity to one or more associated complementary electrodes; and

means for advancing the dielectric paper past said complementary and recording electrodes in increments substantially equal to said width of said recording electrodes such that an elementary dot area is defined by advancing the dielectric paper approximately L divided by W times, said recording electrodes being oriented such that their width dimension is parallel to the direction of advancing the paper, and sufficiently small to effect the appearance of grey tone areas.

4,521,791

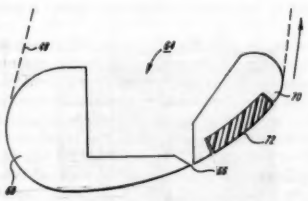
ION PROJECTION PRINTER WITH PSEUDO-CONTINUOUS BACK ELECTRODE

Gene F. Day, Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 20, 1983, Ser. No. 505,645

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—159 **3 Claims**



1. An ion projection printing apparatus for printing on one side of a charge receptor sheet and comprising, sequentially in a processing direction, ion projection charging means, development means and fusing means and characterized by including

back electrode means positioned to be located on the opposite side of the sheet from the charging means and development means and to receive the sheet in intimate contact, said electrode means extending from the charging means through the fusing means and having with at least one discontinuity therein extending across said electrode means transversely to the processing direction, said discontinuity being located between the fusing means and the development means, whereby said back electrode acts, in the electrical sense, as if it were continuous but inhibits thermal flow therethrough between the hot fuser means and the cool charging and development means.

4,521,792

ION PROJECTION PRINTER WITH CHARGE COMPENSATION SOURCE

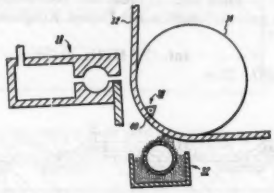
Lloyd D. Clark, San Francisco; Jean K. Wilcox, El Granada, and Gene F. Day, Cupertino, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1983, Ser. No. 527,705

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—159 **7 Claims**

1. An ion projection printing apparatus for printing on one side of a charge receptor sheet movable in a processing direction and comprising sequentially, in said processing direction, ion projection charging means for delivering imaging ions to said one side of said sheet, development means and fusing means, said charging means and said development means being located on said one side of said receptor sheet, and back electrode means located adjacent the opposite side of said sheet for accelerating and focussing the imaging ions, the apparatus being characterized by including



charge compensating means located on said opposite side of said sheet at a position downstream of said charging means for delivering a countercharge to said opposite side of said sheet.

4,521,793

COLORING METHOD AND COLOR-FORMING MATERIAL

Kazuo Kabashima, and Kyugo Tanaka, both of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP83/00056, § 371 Date Jun. 30, 1983, § 102(e) Date Jun. 30, 1983, PCT Pub. No. WO83/02920, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 25, 1983, Ser. No. 513,969

Claims priority, application Japan, Feb. 27, 1982, 57-029797; Dec. 23, 1982, 57-224860; Dec. 24, 1982, 57-225937

Int. Cl.³ B41M *5/16, 5/18, 5/22*

U.S. Cl. 346—201 **31 Claims**

1. A method for coloring an article to be colored, which comprises contacting and reacting, in the article to be colored, (a) at least one aromatically bonded isocyanate compound with (b) at least one imino compound being capable of forming a color by the reaction with said isocyanate compound and having at least one >C=NH group to effect the color formation, wherein at least one of said compounds (a) and (b) is supported on the article to be colored.

4,521,794

ELECTRODE AND SEMICONDUCTOR DEVICE PROVIDED WITH THE ELECTRODE

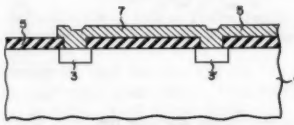
Katsumi Murase, Iruma, and Yoshihiko Mizushima, Tokyo, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Continuation of Ser. No. 304,983, Sep. 23, 1981, abandoned. This application Jul. 3, 1984, Ser. No. 626,487

Claims priority, application Japan, Sep. 30, 1980, 55-137108; Oct. 3, 1980, 55-137674

Int. Cl.³ H01L *45/00*

U.S. Cl. 357—2 **9 Claims**



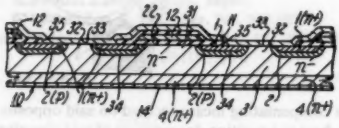
1. An electrode arrangement comprising an amorphous silicon electrode layer disposed on a substrate, said electrode layer consisting essentially of (i) amorphous silicon, (ii) one element of Group IV selected from the group consisting of germanium and tin, and (iii) boron.

4,521,795

INSULATED-GATE FIELD-EFFECT TRANSISTORS

David J. Coe, East Grinstead, and Royce Lowis, Southampton, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1982, Ser. No. 446,141
Claims priority, application United Kingdom, Dec. 7, 1981, 8136819
Int. Cl.³ H01L 29/78
U.S. Cl. 357—23.4 11 Claims



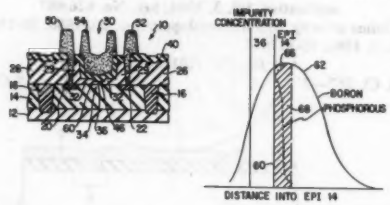
1. An insulated-gate field-effect transistor comprising a semiconductor body having a surface-adjoining source region of one conductivity type which is surrounded in the body by a surface-adjoining second region of the opposite conductivity type, the second region being surrounded in the body by a surface-adjoining third region which is of said one conductivity type and is associated with the transistor drain, an insulating layer on a part of the second region, and a conductive layer on said insulating layer to form an insulated gate of the transistor for capacitively controlling in said part of the second region a conductive channel between the source region and a first part of the third region, characterized in that the third region has a surface-adjoining second part which is remote from the first part, in that an electrode layer extends on said second part of the third region and is connected to said second region, and in that there is provided between said electrode layer and the second part of the third region a Schottky junction having a lower forward voltage drop that the p-n junction between the second and third regions.

4,521,796

MEMORY IMPLANT PROFILE FOR IMPROVED CHANNEL SHIELDING IN ELECTRICALLY ALTERABLE READ ONLY MEMORY SEMICONDUCTOR DEVICE

Kamal Rajkanan, Melville, and Jagir S. Multani, Dix Hills, both of N.Y., assignors to General Instrument Corporation, New York, N.Y.

Continuation of Ser. No. 215,224, Dec. 11, 1980, abandoned. This application Nov. 14, 1983, Ser. No. 550,725
Int. Cl.³ H01L 29/78
U.S. Cl. 357—23.5 14 Claims



1. An electrically alterable read only memory semiconductor device comprising:

a substrate of a material of a first conductivity type,

source and drain regions of a second conductivity type in said substrate,

a memory gate region between said source and drain including two superimposed layers of insulating material on said substrate in said memory gate region, electrical charges capable of being stored at the interface of said two layers, electrodes connected to said source, drain and the upper layer of insulating material of said gate region, and

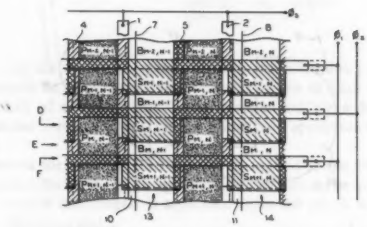
the substrate in said memory gate region having therein a first impurity material of a first conductivity type forming a first region of said first conductivity type having a higher conductivity than said substrate, and a second impurity material of a second conductivity type opposite to said first type forming a second region of said first conductivity type disposed between said first region and the surface of said substrate, said second region having a lower conductivity than said first region to tailor the surface concentration profile of the impurity material in the memory gate region of the substrate.

4,521,797

SEMICONDUCTOR IMAGING DEVICE USING CHARGE-COUPLING DEVICE

Eiji Oda, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 16,358, Feb. 26, 1979, abandoned. This application Jan. 11, 1982, Ser. No. 338,362
Claims priority, application Japan, Feb. 27, 1978, 53-22668
Int. Cl.³ H01L 29/78; G11C 19/28
U.S. Cl. 357—24 7 Claims

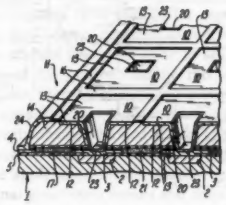


1. A two-dimensional, imaging device comprising a semiconductor substrate of one conductivity type, an orthogonal array of photosensitive regions of an opposite conductivity type formed on said semiconductor substrate, charge transfer channels separating columns of said orthogonal array, gate means also separating columns of said photosensitive regions for enabling a transfer of light-caused charges from said photosensitive region to said charge transfer channels, each of said charge transfer channels including electrodes for charge storage regions and electrodes for potential barrier regions, these two type of electrodes being disposed on but electrically isolated from the semiconductor substrate of said one conductivity type to form buried channel charge coupled devices, one pair of said two types of electrodes being disposed beside one photosensitive region and electrically isolated from each other, another pair of said two types of electrodes adjacent said one pair of two type electrodes being disposed beside another photosensitive region adjacent to said one photosensitive region in the same column of said orthogonal array and electrically isolated from each other, said electrode for the charge storage region of said one pair and said electrode for a potential barrier region of said other pair being electrically connected with each other, means for applying a combination of gate pulses to said gate electrodes and two phases of clock pulses to said charge shift electrodes for transferring charges from said photosensitive areas to said charge transfer channels, and means for alternately applying the two phases of the clock pulses to said charge shift electrodes for shifting the transferred charges along said columns.

4,521,798
INFRA-RED RADIATION IMAGING DEVICES AND METHODS FOR THEIR MANUFACTURE

Ian M. Baker, Romsey, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,835
Claims priority, application United Kingdom, Mar. 27, 1981, 8109778
Int. Cl.³ H01L 27/14, 31/00, 29/06, 23/48
U.S. Cl. 357—30 17 Claims



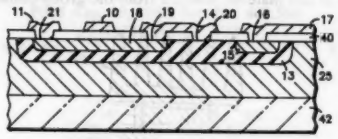
1. An infrared radiation imaging device comprising:
a substrate having a major surface, said substrate comprising a plurality of circuit elements for processing electrical signals;
a conductor pattern at the major surface of the substrate, said pattern being electrically connected to the circuit elements;
a layer of electrically insulating adhesive provided on the major surface of the substrate over the conductor pattern, said layer having a plurality of apertures therethrough to the conductor pattern, each aperture having side walls;
a body of infrared-sensitive material having first and second opposite surfaces, said body being provided on the adhesive layer and being secured to the substrate by the adhesive layer, the first surface of said body contacting only the adhesive layer, said body comprising a plurality of infrared radiation detector elemments and having a plurality of apertures having side walls extending through the body from the second surface to the first surface, said apertures being provided over the apertures in the adhesive layer, each aperture in the body enclosed by a detector element, each detector element comprising a p-n junction formed by a region of a first conductivity type adjacent a portion of the body having a second conductivity type opposite to the first conductivity type, the region of the first conductivity type extending through the infrared-sensitive body at the side walls of the aperture;
a first metallization on the side walls of each aperture, each first metallization electrically contacting the infrared-sensitive body at a region of the first conductivity type and contacting the conductor pattern;
a passivating layer contacting the second surface of the body at locations surrounding each aperture; and
a second metallization contacting the portion of the body having the second conductivity type at part of the second surface of the body not contacted by the passivating layer.

4,521,799
CROSSUNDER WITHIN AN ACTIVE DEVICE

Robert B. Davies, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1982, Ser. No. 453,405
Int. Cl.³ H01L 27/2, 29/72, 27/4
U.S. Cl. 357—51 17 Claims

1. A semiconductor structure comprising:
a semiconductor substrate having a first surface;
an active device located in said substrate, extending to said first surface, and having an emitter region, a base region, and a collector region;
a conductive cross-under, separated from said emitter region and formed in an extension to said base region, having the same conductivity type as said emitter region; and

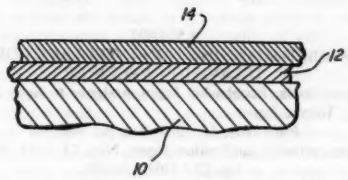


a first conductor passing over said cross-under and insulated therefrom.

4,521,800
MULTILAYER PHOTOELECTRODES UTILIZING EXOTIC MATERIALS

Arthur T. Howe, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 15, 1982, Ser. No. 434,603
Int. Cl.³ H01L 23/48
U.S. Cl. 357—67 8 Claims



1. A multilayer structure which comprises:
(a) an n-type semiconductor;
(b) a first layer which is in direct contact with said n-type semiconductor, wherein said first layer comprises a compound which contains at least one first element in anionic form which is selected from the group consisting of phosphorus, arsenic and antimony, and at least one second element in cationic form which is selected from the group consisting of vanadium, titanium, zirconium, hafnium, niobium and tantalum; and
(c) a second layer comprising a conducting material which is in direct contact with said first layer.

6. A multilayer structure which comprises:
(a) an n-type silicon semiconductor;
(b) a layer of a lanthanide boride which is in direct contact with said n-type semiconductor; and
(c) a layer of conducting material on said lanthanide boride layer.

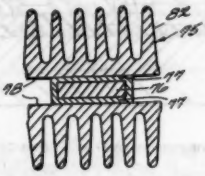
4,521,801
SEMICONDUCTOR DEVICE WITH COMPOSITE LEAD WIRE

Taketoshi Kato, and Akira Onoe, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 23, 1982, Ser. No. 422,143
Claims priority, application Japan, Oct. 9, 1981, 56-160085
Int. Cl.³ H01L 23/36, 23/54, 23/14
U.S. Cl. 357—71 18 Claims

1. A semiconductor device comprising:
a semiconductor element of silicon; and
conducting means attached to said semiconductor element including a first element having a lower thermal expansion coefficient than that of said semiconductor element and a second element overlapping said first element, and having a

higher thermal expansion coefficient than that of said semiconductor element and having a higher electrical conductivity than that of said first element, said first element being made of one material selected from the group consisting of



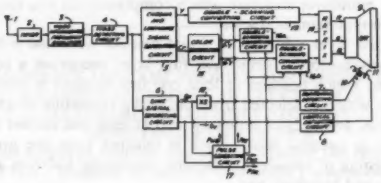
an alloy of about 36% Ni-Fe, an alloy of abut 39% Ni-Fe, an alloy of about 32% Ni - and about 4% Co-Fe, and an alloy of 81 to 85% Fe - about 5% Si - and about 10% Cr-B made by rapid quenching.

4,521,802

DOUBLE-SCANNING NON-INTERLACE COLOR TELEVISION RECEIVER

Yasunari Ikeda, Funabashi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 12, 1982, Ser. No. 440,985
Claims priority, application Japan, Nov. 13, 1981, 56-181973
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—11 **22 Claims**



1. A double-scanning non-interlace color television receiver for receiving an interlace color television signal having alternating odd and even fields of scanned lines which are normally interlaced, as displayed, comprising:

receiver means for receiving said interlace color television signal and including means for generating respective chroma and luminance scanning line signals in response thereto;

visual display means; and

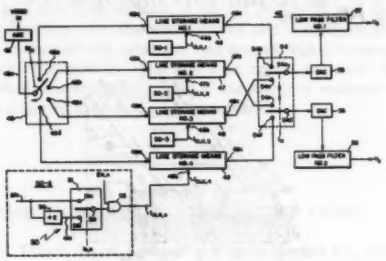
non-interlace converting means including luminance double-scanning means for generating an averaged luminance scanning line signal from each two consecutive luminance scanning line signals of the same field, and for supplying said consecutive luminance scanning line signals and said averaged luminance scanning line signal to said visual display means for display by the latter of each said averaged luminance scanning line signal between the respective two consecutive luminance scanning line signals, and means for supplying to said visual display means color difference signals derived from said chroma scanning line signal corresponding to one of said two consecutive luminance scanning line signals for display by said visual display means in synchronism with said averaged luminance scanning line signal.

4,521,803

SYSTEM FOR COMPATIBLE TRANSMISSION OF HIGH-RESOLUTION TV

Norman C. Gittinger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 7, 1982, Ser. No. 433,562
Int. Cl.³ H04N *9/32*
U.S. Cl. 358—12 **98 Claims**



1. A method for increasing the vertical luminance resolution capacity of a transmitted television signal, comprising the steps of:

(a) providing a television camera having a luminance video output signal of magnitude responsive to the visual luminance value at a raster spot then being scanned by a beam;

(b) scanning the beam through a plurality of lines in a horizontal direction;

(c) scanning the beam through each of a plurality L of different vertically-displaced lines during each of the plurality of horizontal line scans;

(d) generating a like plurality L of substantially simultaneous luminance signals each responsive to the luminance video output signal provided by the camera when the beam is at positions defined by the associated one of the plurality L of vertically-displaced lines; and

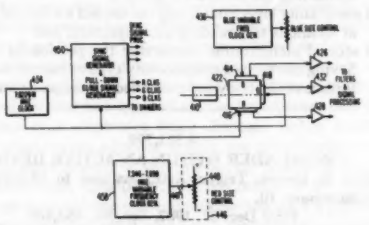
(e) modulating a different characteristic of at least one luminance carrier with each of the plurality L of luminance signals to transmit the increased vertical luminance resolution capacity television signal.

4,521,804

SOLID-STATE COLOR TV CAMERA IMAGE SIZE CONTROL

Sidney L. Bendell, Riverton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 25, 1983, Ser. No. 469,773
Int. Cl.³ H04N *3/15, 9/09*
U.S. Cl. 358—51 **14 Claims**



1. An image size control arrangement for a color television camera, comprising:

first and second solid-state imagers, each including an array of discrete light-responsive regions and a buffer register;

optical means optically coupling a first color component of a scene to be imaged to said first imager and a second

color component of said scene to be imaged to a second imager, said first and second color components being imaged to different sizes thereby causing color misregistration;

pull-down clock generating means coupled to said solid-state imagers for establishing the recurrent light integrating intervals of said arrays and for transferring signals representative of said scene from each of said arrays to its corresponding buffer register;

controllable clock signal generating means coupled to said buffer registers for applying respective clock signals to said respective buffer registers for controlling the rates of transfer of signals from said buffer registers, and further including rate control terminal means;

registration control means coupled to said rate control terminal means for controlling the rate of said respective clock signals, thereby controlling said rates of transfer of signals from said buffer register relative to each other so as to apparently change the size of said imaged color components whereby said misregistration is reduced; and

controllable application means coupled to said controllable clock signal generating means and responsive to a change in relative rates of said respective clock signals for controlling the relative times of application of said respective clock signals to said respective buffer registers in a manner so as to prevent movement of the apparent center of said imaged color components when their apparent size is changed.

4,521,805

PRINTING APPARATUS OR SYSTEM

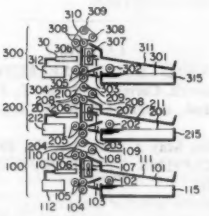
Naoki Ayata, Machida; Seiji Saito, Yokosuka; Hidetoshi Suzuki; Kunitaka Ozawa, both of Tokyo; Noboru Koumura, Narashino, and Koji Kazuma, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,464

Claims priority, application Japan, Apr. 24, 1981, 56-61421; Apr. 24, 1981, 56-61422; Apr. 27, 1981, 56-62542; Apr. 28, 1981, 56-63462; Apr. 28, 1981, 56-63463

Int. Cl.³ H04N *1/46*

U.S. Cl. 358—75 **23 Claims**



1. A printing system comprising:

first recording means for recording an image on a recording medium in a first mode;

second recording means for recording an image on a recording medium in a second mode different from said first mode, said second recording means being different from said first recording means; and

selecting means for selecting said first or second recording means to perform a recording operation;

wherein one of said first and second modes is adapted for recording a halftone image.

4,521,806

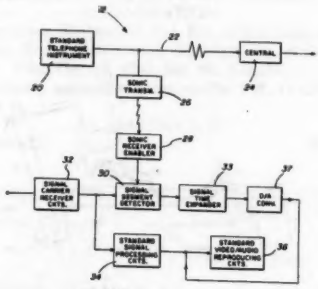
RECORDED PROGRAM COMMUNICATION SYSTEM

Nicholas F. Abraham, Cape Coral, Fla., assignor to World Video Library, Inc., Fort Worth, Tex.

Filed Aug. 19, 1982, Ser. No. 409,566

Int. Cl.³ H04M *7/18*

U.S. Cl. 358—86 **5 Claims**



1. In a communication system through which a plurality of subscriber stations are linked by telephone network with a common service station at which a plurality of video/audio signal sources are located for transmission of continuous program information, in response to telephone dialed selection signals to the subscriber stations through a common signal carrier path independent of the telephone network, a signal transmission method including the steps of: processing the information sequentially readout at the service station for broadcast during predetermined transmission periods; detecting time-spaced segments of the broadcast program information at each of the subscriber stations corresponding to the selection signals originating therefrom; and sequentially decoding the detected segments of the broadcast program information for real time reproduction thereof at the subscriber stations, including the steps of: storing additional information at the service station corresponding to the segments of the broadcast program information; selecting the additional information in response to reception of said selection signals; inserting the selected additional information during program spacing intervals between the segments of the broadcast program information for broadcast to the subscriber stations in advance of said segments of the broadcast information, registering said selection of the additional information following the program spacing intervals during broadcast of the segments of the program information; and cancelling said registration of previously selected additional information in response to telephoned signals received prior to termination of the spacing intervals.

4,521,807

OPTICAL INSPECTION SYSTEM

Michael J. Werson, Eastleigh, England, assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Jul. 13, 1982, Ser. No. 397,716

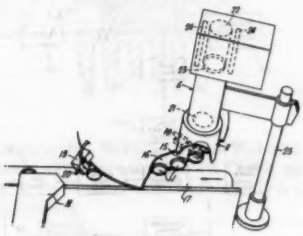
Claims priority, application United Kingdom, Jul. 17, 1981, 8122146

Int. Cl.³ H04N *7/18, 7/00*

U.S. Cl. 358—106 **12 Claims**

1. An optical inspection system for the inspection of circular workpieces, said inspection system comprising an electronic camera, said electronic camera including an electronically active image receiving surface and an optical system for focusing an image of said circular workpieces on said electronically active image receiving surface; means to move said circular workpieces in to a predetermined position in relation to said optical system of said camera; means for scanning said electronically active image receiving surface in directions extend-

ing substantially radially across said electronically active image receiving surface to produce an output signal; signal analyser means arranged to monitor said output signal corresponding to each of said radial scans to determine the presence at required positions along each of said scans of each element of said workpiece and to determine absence of unexpected elements along each of said scans; and, means to define timing



windows at times during each of said scans corresponding to the required positions along each scan at which said elements of said workpiece are expected, wherein said signal analyser means monitors said output signal corresponding to each scan in accordance with said timing windows to determine the presence or absence of events in each of said timing windows, whereby the presence of any irregularity in said workpiece is detected.

4,521,808

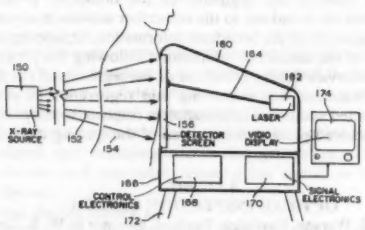
ELECTROSTATIC IMAGING APPARATUS

Poen S. Ong; Alfonso Zermeno; Lee M. Marsh, Jr., all of Houston, Tex.; James M. Hevezi, Rapid City, S. Dak., and Ronald W. Cowart, Houston, Tex., assignors to University of Texas System, Austin, Tex.

Division of Ser. No. 22,989, Mar. 22, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,611

Int. Cl.³ H04N *3/08*

U.S. Cl. 358—111 **19 Claims**



1. A method of recording and reading out a latent image comprising:

exposing a multilayered detector apparatus whose photoconductive layer has no surface potential to a modulated radiation flux capable of producing electron hole pairs, said photoconductive layer being biased by an electric field during said exposure, whereby a modulated surface charge is placed on the photoconductive layer;

scanning said exposed detector with a photon beam whereby said modulated surface charge is at least partially discharged; and

measuring the charging potential of said discharge as a function of time.

4,521,809

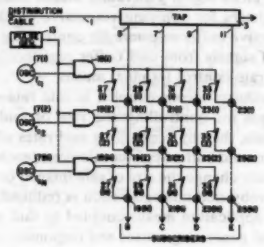
METHOD AND APPARATUS FOR CONTROLLING ACCESS TO SELECTED TELEVISION PROGRAMS

Joseph P. Bingham, Fayetteville, and Douglas J. Hatch, Chittenango, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,209

Int. Cl.³ H04N *7/16*; H04K *1/02*

U.S. Cl. 358—120 **10 Claims**



1. A method for controlling subscriber access to selected television programs, said programs having regularly spaced horizontal synchronizing pulses therein and being modulated onto separate carrier waves, each having a different carrier frequency, for transmission as individual channels over a controlled access transmission medium, characterized in that said method comprises the steps:

generating oscillating signals having frequencies substantially equal to the respective carrier wave frequencies of the channels to be controlled and having amplitudes greater than that of the horizontal synchronizing pulses;

cycling said oscillating signals on and off to generate respective pulsed signals in which the duration of said pulses are substantially equal to the duration of said horizontal synchronizing pulses, and the pulse repetition rates of said pulsed signals differ from that of said horizontal synchronizing pulses; and

selectively combining said pulsed signals with the respective carrier waves carrying the programs to be controlled, whereby the television receiver of a subscriber not authorized to receive said respective programs, will interpret said superimposed pulsed signals as valid horizontal synchronizing signals and throw itself out of synchronization with the relevant program, thereby rendering the received picture unviewable.

4,521,810

VIDEO SOURCE SELECTOR

John J. Nigborowicz, Carmel, and Karl L. Friedline, Indianapolis, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed May 3, 1983, Ser. No. 491,178

Int. Cl.³ H04N *5/22*; H03K *17/00, 17/56*

U.S. Cl. 358—181 **8 Claims**

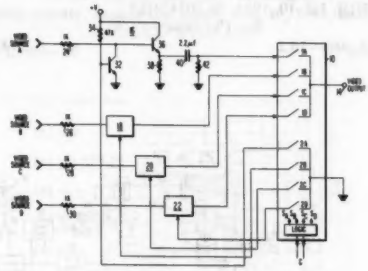
1. A video source selector comprising:

a switch arrangement including first and second groups of switches, each switch having a conduction path coupled between an input and an output, the conduction of respective switches of said first group and of said second group being selectively controlled in pairs in response to a coded selection signal;

said switches of said first group having their inputs coupled to respective ones of a plurality of video signal sources and their outputs coupled in common to an output terminal for selectively conducting video signal from a selected one of said video signal sources to said common output terminal when one of said switches of said first group is rendered conductive in response to said coded selection signal;

each switch of said second group having its input coupled in common to a first reference potential point and providing a respective control signal dependent on the conductive state of said switch at its output; and

a plurality of signal inhibiting elements, each element including a conduction path having one end coupled to a respective one of said video signal sources for selectively inhibiting video signal from passing from said respective video signal sources to said switches of said first group in response to respective ones of said control signal provided at the respective outputs of said switches of said second group.



4,521,811

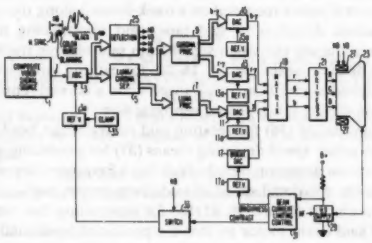
BEAM CURRENT LIMITING ARRANGEMENT FOR A DIGITAL TELEVISION SYSTEM

John W. Stoughton, and Donald H. Willis, both of Marion County, Ind., assignors to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 606,022, May 2, 1984, abandoned. This application Aug. 30, 1984, Ser. No. 646,033

Int. Cl.³ H04N *5/16, 5/197, 5/21, 9/535*

U.S. Cl. 358—243 **8 Claims**



1. In a digital television system including an analog-to-digital converter for converting a composite television signal, including both luminance and chrominance components, to corresponding digital samples, a digital processing section for digitally processing said digital samples to produce at least first and second groups of digital samples representing respective components of image information, a first digital-to-analog converter for producing a first analog signal corresponding to said first group of digital samples, a second digital-to-analog converter for producing a second analog signal corresponding to said second group of digital samples, a picture tube responsive to said first and second analog signals for producing an image and being capable of generating an excessive beam current in response to said first and second analog signals, apparatus for reducing said excessive beam currents comprising:

beam current control means coupled to said picture tube for generating a control signal representing the beam current generated by said picture tube; and

analog-to-digital control means coupled to said analog-to-digital converter for controlling the range of values of said digital samples representing said analog composite television in response to said beam current representative control signal.

4,521,812

METHOD OF IMPROVING CONTRAST ACCENTUATION

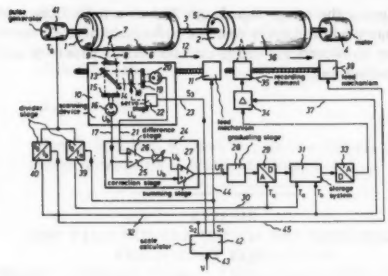
Hans-Georg Knop, Heikendorf, Fed. Rep. of Germany, assignor to Dr.-Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Oct. 19, 1982, Ser. No. 435,255

Claims priority, application European Pat. Off., Oct. 19, 1981, 81108501.8

Int. Cl.³ H04N *1/38*

U.S. Cl. 358—287 **10 Claims**



1. In a method of improving contrast accentuation in electronic reproduction apparatus of the kind in which a composite original comprising both continuous tone areas and linework areas is scanned opto-electronically dot-by-dot and line-by-line to obtain an image signal, at least one surround signal is generated by evaluation of the area surrounding the image dots, and a correction signal which is superimposed on the image signal for contrast accentuation is derived from the surround and image signals, and in which the original is subsequently recorded on a recording medium, the improvement which comprises varying the width of overlap between the image and correction signals continuously, independently of the image dot size, and adjusting said width of overlap to control the effective range of contrast accentuation on the recording medium whereby to optimize the recording of a composite original with substantial elimination of white fringes and edges at the contours of the recorded linework.

4,521,813

RECORDING METHOD IN A FACSIMILE RECEIVER

Takashi Yoshida; Masakatsu Fujie, both of Ibaraki; Junichi Matsuno, Toride, and Hideyuki Ouchi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1982, Ser. No. 446,204

Claims priority, application Japan, Dec. 4, 1981, 56-194509

Int. Cl.³ H01M *1/22*

U.S. Cl. 358—296 **17 Claims**

1. In a variable speed sub-scan system facsimile receiver having a receiving unit for demodulating a coded facsimile signal to an image data, a memory unit for storing the image data, a paper feed unit for feeding a record paper at a variable speed in accordance with a signal from said receiving unit and a recording unit for forming an image on the record paper;

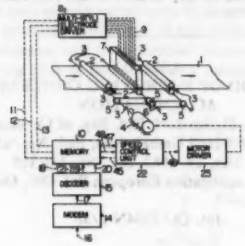
a recording method comprising the steps of;

temporarily storing the image data line by line in said memory unit;

detecting the number of stored lines;

issuing a variable speed command to said paper feed unit in accordance with the detected number of stored lines to

control a paper feed speed by a speed pattern determined by the number of stored line; and



reading out the image signal, one line at a time, from said memory unit for every one line movement of said record paper to record the image on said record paper by said recording unit.

4,521,814

METHOD AND APPARATUS FOR SIMULTANEOUSLY OUTPUTTING A GRAPHIC SIGNAL AND AN ALPHANUMERIC SIGNAL BY USING AN IMAGE REPRODUCING SYSTEM

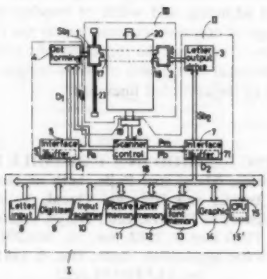
Yoshio Ono, and Seiya Sakamoto, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Oct. 13, 1983, Ser. No. 541,796

Claims priority, application Japan, Oct. 13, 1982, 57-180462

Int. Cl.³ G04N *1/22*; G01D *15/06*

U.S. Cl. 358—296 **14 Claims**



10. In an apparatus for recording an image on a medium by scanning the medium in a primary scanning direction and feeding recording heads in a sub-scanning direction, the apparatus having two recording heads, the two heads having different scan lengths determined by respective products of numbers and diameters of beam components thereof, the improvement comprising:

synchronizing means for synchronizing movement of said two recording heads, including

means for feeding said recording heads substantially simultaneously in said sub-scanning direction.

4,521,815

REPRODUCING APPARATUS CAPABLE OF PERFORMING HIGH-SPEED REPRODUCTION OF A VIDEO SIGNAL

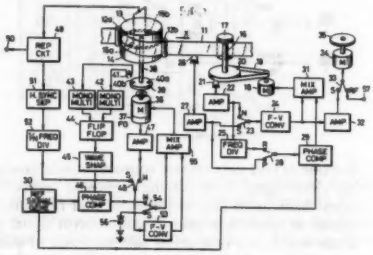
Yoshio Tokuyama, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Jul. 8, 1982, Ser. No. 396,293

Claims priority, application Japan, Jul. 10, 1981, 56-102473[U]; Jul. 10, 1981, 56-102474[U]

Int. Cl.³ H04N *5/783*

U.S. Cl. 360—10.2 **5 Claims**



1. A video signal reproducing apparatus capable of performing high-speed reproduction, said video signal reproducing apparatus comprising:

reproducing means (**13**, **15***a*, **15***b*, **49**) comprising at least one rotary video head (**15***a*, **15***b*) for scanning over a tape (**11**) recorded with a video signal on tracks formed obliquely with respect to the longitudinal direction of said tape and control pulses recorded on a track formed along the longitudinal direction of said tape, said reproducing means reproducing the video signal from said oblique tracks;

tape driving means (**34**, **35**, **16–20**) for causing tape travel at a speed higher than a tape speed upon a normal reproduction during a high-speed reproduction;

a drum motor (**36**) for rotating said rotary video head;

drum motor speed detecting means (**37**) for producing a first rotation detection signal which has a frequency dependent on the rotational speed of said drum motor; and

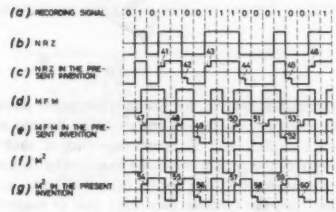
servo circuit means (**48**, **51–56**) for controlling the rotation of said drum motor so that a reproduced horizontal synchronizing signal within the video signal reproduced by said reproducing means has a constant period which is substantially identical to the period of a horizontal synchronizing signal within the recorded video signal,

said servo circuit means comprising a single first frequency-voltage converter (**53**) for subjecting an input signal to a frequency-voltage conversion and for supplying an output voltage to said drum motor, a reference voltage source (**56**) for generating a reference voltage having a predetermined constant value, first switching means (**52**, **48**) for selectively supplying the output first rotation detection signal of said drum motor speed detecting means to said first frequency-voltage converter during the normal reproduction and for selectively supplying a periodic signal within the video signal reproduced by said reproducing means to said first frequency-voltage converter during the high-speed reproduction, and second switching means (**54**) for selectively supplying the output reference voltage of said reference voltage source to said drum motor.

4,521,816
MAGNETIC RECORDING METHOD FOR DIGITAL SIGNAL

Akihiko Kougami, Kokubunji; Seiichi Mita, Hachioji; Toru Kirino, Kodaira, and Shusaku Nagahara, Hachioji, all of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1982, Ser. No. 405,342
Claims priority, application Japan, Aug. 17, 1981, 56-127780
Int. Cl.³ G11B 5/09
U.S. Cl. 360—45 **6 Claims**


(a) RECORDING SIGNAL
(b) NRZ
(c) NRZ IN THE PRESENT INVENTION
(d) M F M
(e) M F M IN THE PRESENT INVENTION
(f) M²
(g) M² IN THE PRESENT INVENTION

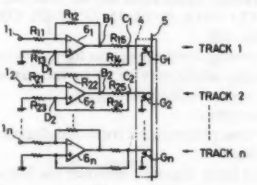
1. In a magnetic recording method for digital signals having a predetermined bit period wherein magnetic patterns corresponding to the digital signals are recorded on a magnetic medium;

the steps comprising detecting from said digital signals a recording current of an identical polarity which continues for a time at least equal to 1.5 times said bit period of the digital signals, and setting a current reversal amplitude Iv of a current reversal point at which the recording current of said identical polarity is started at a smaller level that the current reversal amplitude Io of the current reversal points from which the recording current will continue with identical polarity for less than 1.5 times the bit period of the digital signals, and wherein said smaller level of the current reversal amplitude Iv continues for a predetermined period of time.

4,521,817
CIRCUIT ARRANGEMENT FOR MAGNETIC RECORDING APPARATUS HAVING A MULTI-TRACK HEAD

Kohhei Sasamura, and Takaro Mori, both of Sagamihara, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jun. 21, 1982, Ser. No. 390,738
Claims priority, application Japan, Jun. 22, 1981, 56-96355
Int. Cl.³ G11B 5/09
U.S. Cl. 360—46 **1 Claim**



1. A circuit arrangement for recording a plurality of signals on a multi-track by means of a multi-track head on a magnetic recording medium, comprising:

(a) a plurality of recording heads included in the multi-track head;

(b) a plurality of amplifiers responsive respectively to said plurality of signals to be recorded, the output signal from said amplifiers being respectively fed to the heads, each of said amplifiers having an operational amplifier having an inverting input terminal, a noninverting input terminal and an output terminal; and

(c) means for causing each of said amplifiers to function as a constant-current amplifier throughout the entire frequency range of said input signals, said means having first to fifth resistors connected to each of said operational amplifiers, said first resistor being connected between an input terminal from which one of said plurality of signals is fed, and said inverting input terminal, said second resistor being connected between said inverting input terminal and said output terminal, said third resistor being connected between said noninverting input terminal and ground, said fourth resistor being connected between said noninverting input terminal and a first terminal of said head having a second terminal connected to ground, and said fifth resistor being connected between said output terminal and said first terminal of said head, the resistances of said first to fourth resistors being selected to satisfy the relationship of:

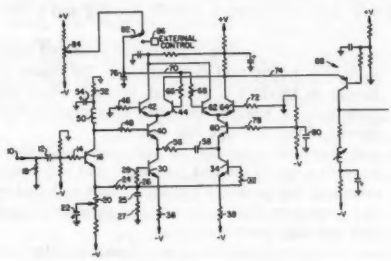
$$R_{12}/R_{11}=R_{14}/R_{13}$$

wherein R_{11}, R_{12}, R_{13} and R_{14} are respectively the resistances of said first to fourth resistors.

4,521,818
ONE PLUS DOUBLE OMEGA SQUARED RADIO FREQUENCY EQUALIZER

Barrett E. Guisinger, Saratoga, Calif., assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 324,773, Nov. 25, 1981, Pat. No. 4,405,954. This application Jan. 31, 1983, Ser. No. 462,547
Int. Cl.³ G11B 5/45, 5/02
U.S. Cl. 360—65 **6 Claims**



1. A circuit for selectively combining an input signal with the same signal after double differentiation to produce a combined output signal in response to a control signal without introducing the control signal into the output signal, the circuit comprising

a first and a second amplifier circuit, each circuit having corresponding separate pairs of input stages and separate pairs of parallel connected, selectively gain controllable output stages driven by the input stages,

a first output terminal,

a second output terminal,

means for connecting corresponding ones of the output stages of the first and second amplifier circuits to supply their outputs to the first output terminal and for connecting the other output stages of each amplifier circuit to supply their outputs to the second output terminal,

control signal means for controlling the gains of opposite ones of the output stages of the first and second amplifier circuits, the other output stages having predetermined, fixed gains,

means for supplying an input signal to corresponding ones of the input stages of both the first and second amplifier circuits, and

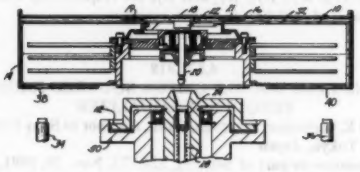
double differentiation means for supplying a second derivative of the input signal in inverted form to the other input stage of the first amplifier circuit and in noninverted form to the other input stage of the second amplifier circuit.

4,521,819

CARTRIDGE LOAD MECHANISM

John W. Elsing, Edina; Gene F. Gorham, Hopkins, and Steven D. Knopp, Bloomington, all of Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Oct. 4, 1982, Ser. No. 432,573
Int. Cl.³ G11B *25/04*
U.S. Cl. 360—97 **8 Claims**



1. A cartridge load mechanism for a cartridge disk drive having a spindle, comprising:

a disk cartridge having a flexible housing and a disk pack mounted therein;

a cartridge cradle having a transverse yoke and means for mounting therein said disk cartridge, the cradle further having an aperture in a bottom through which the disk pack may be lowered into mounting contact with the spindle of the cartridge disk drive;

a nub mounted centrally on said yoke and projecting towards a top of the disk cartridge; said nub adapted to press said disk pack into locking contact with said spindle at a lowermost position by pressing against the top of the disk cartridge flexible housing;

means for constraining the motion of said cartridge cradle to substantially the axial direction vis-a-vis said spindle;

a lever having a crank arm which is affixed to said cradle by means adapted to accommodate disparity in motion between said lever and said cradle; said lever pivotally mounted on said cartridge disk drive;

a hinge pivotally mounted on said cartridge disk drive;

a door fixedly mounted on said hinge;

an arm one end of which is pivotally mounted on said hinge and

the other end of which is pivotally mounted on a second crank arm of said lever;

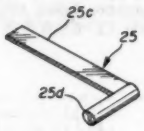
means including said hinge and arm for connecting same to said lever such that partially closing the door causes the arm and lever to lower the cradle to a lowermost position wherein the nub presses the disk pack into locking contact with the spindle and further closing movement of the door moves the cradle back up to an intermediate position wherein the flexible housing top flexes back such that it no longer presses on the disk pack, the disk pack remaining locked onto the spindle, whereby the disk pack is free to spin without rubbing against the housing top.

4,521,820

INSERT FOR BLOCKING OPERATION OF THE DISC WRITE SWITCH IN USE OF COMPUTER DISKETTES

James D. Fann, P.O. Drawer X, Simonton, Tex. 77476

Filed Sep. 30, 1982, Ser. No. 431,630
Int. Cl.³ G11B *23/02*
U.S. Cl. 360—133 **3 Claims**



1. A computer diskette, for use in a computer having a disc drive slot with a door closing the entrance thereto and a disc drive write switch arm adjacent one end of said entrance which controls the read-write-erase function by following into an edge slot adjacent to one corner of said diskette, comprising

a single, thin, flat circular recording disc of magnetic material,

a thin, flat envelope, having an enlarged central opening, enclosing and supporting said disc for rotary movement therein,

said envelope having a notch in one edge portion, adjacent to one corner thereof, adapted to be positioned with said notch at said one end of said entrance and normal thereto, for entrance of the computer disc drive write switch arm thereinto, permitting movement of such switch arm to a selected position permitting the computer to write to the diskette,

a slide strip slidably positioned within said one edge portion substantially coplanar with said envelope and having an outer end portion, extending into said drive slot entrance when positioned in said drive slot, said outer end portion being positioned to be grasped for manual operation from outside the computer disc slot when said diskette is positioned therein for computer operation,

said strip being manually movable longitudinally to one position extending through and blocking said notch and to another position opening said notch said outer end portion extending into said drive slot entrance when in said open position and providing a visual indication that said notch is not write-protected.

4,521,821

OPERATING LEVER APPARATUS

Minoru Kobayashi, and Shigeru Nemoto, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1982, Ser. No. 359,857
Claims priority, application Japan, Mar. 30, 1981, 56-46915
Int. Cl.³ G11B *15/48, 15/18, 17/00;* G05G *11/00*
U.S. Cl. 360—137 **15 Claims**

1. An operating lever apparatus for use in combination with a tape recorder which may be set to various modes, said operating lever apparatus comprising:

a first base plate;

a second base plate spaced from and disposed parallel to the first base plate;

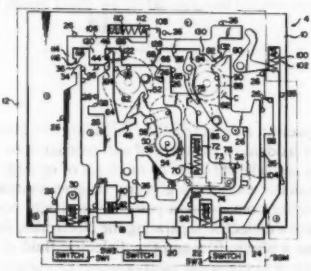
a playback lever disposed between the first and second base plates and being slideably movable between a first position and a second position along and substantially parallel to the first and second base plates, said playback lever setting, upon arriving at its second position, the tape recorder to playback mode;

a recording lever disposed between the first and second base plates and being slideably movable between a first position and a second position along and substantially parallel to the first and second base plates, said recording lever setting, upon

arriving at its second position, the tape recorder to recording mode;

a stop lever disposed between the first and second base plates and being slideably movable between a first position and a second position along and substantially parallel to the first and second base plates;

a first auxiliary lever disposed between the first and second base plates and being slideably movable between a first position and a second position along and substantially parallel to the first and second base plates, said first auxiliary lever including means for holding the playback lever in its second position while said first auxiliary lever remains at its first position and said first auxiliary lever releasing the playback lever upon said first auxiliary lever being moved to its second position; and



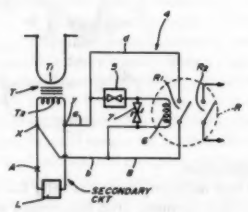
a second auxiliary lever disposed between the first and second base plates and being slideably movable between a holding position and a releasing position along and substantially parallel to the first and second base plates, said second auxiliary lever including means for holding the recording lever in its second position while said second auxiliary lever remains at its holding position, and said second auxiliary lever moving from its holding position to its releasing position responsive to said stop lever moving from its first position to its second position, thus releasing the recording lever from its second position and then moving the first auxiliary lever from its first position to its second position and finally releasing the playback lever from its second position.

4,521,822

CURRENT TRANSFORMER PROTECTION DEVICE

Julien Simard, Brossard, Canada, assignor to Hydro-Quebec, Montreal, Canada

Continuation-in-part of Ser. No. 283,966, Jul. 16, 1981, abandoned. This application Jun. 30, 1983, Ser. No. 509,384
Claims priority, application Canada, Mar. 3, 1981, 372141
Int. Cl.³ H02H 7/04
U.S. Cl. 361—35 **5 Claims**



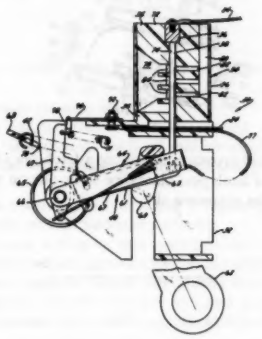
1. A system for protecting the secondary winding of an HV current transformer of a power network against overvoltages caused by an open secondary circuit, said system comprising a shunting device of the mechanical latching type for short-circuiting said secondary winding, a triggering device acting as a crowbar and operative when subjected to a voltage higher than the voltage appearing across the terminals of said secondary winding in normal operating conditions and during a fault on the HV power network, said triggering device being connected in series with a voltage regulator acting as a clamp, and said shunting device being connected in parallel with said voltage regulator whereby said regulator will energize said shunting device to short-circuit said secondary winding of the current transformer.

4,521,823

SUBMERSIBLE PRIMARY CIRCUIT BREAKER

Edwin A. Link, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Aug. 30, 1982, Ser. No. 412,602
Int. Cl.³ H02H 7/04
U.S. Cl. 361—38 **5 Claims**



1. In a self-protected transformer including a casing having a coil and core assembly immersed in a dielectric fluid within said casing, the assembly including primary and secondary circuits, the improvement comprising a circuit breaker in the primary circuit, said circuit breaker being immersed in the dielectric fluid and operatively connected to said coil and core assembly, said circuit breaker including trip-free means responsive to predetermined electrical conditions to interrupt the power circuit to the coil and core assembly, said trip-free means includes a U-shaped bimetal and a current transformer mounted on one leg of said bimetal, said current transformer being connected in series with said primary circuit of said transformer whereby said bimetal will respond to the heat generated by the current transformer and/or the magnetic force of the current transformer core.

4,521,824

INTERRUPTER MECHANISM FOR A GROUND FAULT CIRCUIT INTERRUPTER

Robert A. Morris; George W. Kiesel, both of Burlington, and Paul T. Rajotte, Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,627
Int. Cl.³ H02H 3/347
U.S. Cl. 361—45 **19 Claims**

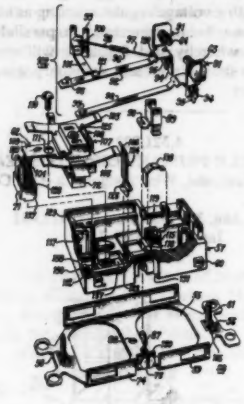
1. A ground fault circuit interrupter comprising:

an apertured molded case;

a trip solenoid and signal processor circuit within said case; and

a pair of fixed and moveable contacts operatively mounted proximate a trip lever and an operating mechanism, said operating mechanism causing said fixed and moveable contacts to become separated upon operation of said trip lever, said operating mechanism including a crossarm member holding said moveable contacts in electrical connection with said fixed contacts against the bias of a pair of moveable contact arms carrying said moveable contacts, said operat-

ing mechanism comprising a moveable crossarm operating member and a moveable button member interconnected by a



latch pin, said crossarm including a latch pin clearance slot and a pair of latch post clearance slots, one on either side of said latch pin clearance slot.

4,521,825

GAS IGNITION CIRCUITS

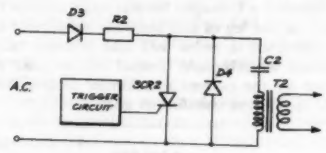
John S. Crawford, Adelaide, Australia, assignor to Technical Components Pty. Ltd., Hendon, Australia

Filed Oct. 17, 1983, Ser. No. 542,858

Claims priority, application Australia, Oct. 20, 1982, PF6437

Int. Cl.³ F23Q *3/00*; F23Y *2/28*

U.S. Cl. 361—253 **9 Claims**



1. A circuit for generating a spark to ignite a gas or other fuel burner, comprising:

a charging circuit;

a charge storage capacitor coupled to said charging circuit;

a spark output transformer connected in series with said capacitor;

an SCR switching device connected in parallel to said capacitor and transformer for discharging the charge stored in the capacitor; and

a non-linear positive resistance conductive element connected from the anode to the gate of said SCR;

so that when the anode voltage reaches the required value a trigger signal is applied via said non-linear conductive element to the gate of said SCR to trigger the discharge of the capacitor by the SCR, whereby said triggering is effected by said SCR without requiring an additional triggering device.

4,521,826

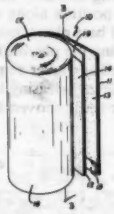
DIELECTRIC FLUID FOR A COMPACITOR

Vandos Shedigian, and Gerald A. Voyles, both of Indianapolis, Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Feb. 25, 1980, Ser. No. 124,283

Int. Cl.³ H01G *4/22*

U.S. Cl. 361—314 **8 Claims**



1. In a capacitor, a dielectric fluid including 0 to about 10 wt. % of an anti-oxidant or mixtures of anti-oxidant, 0 to about 10 wt. % of an epoxide stabilizer or mixtures of epoxide stabilizers, the remainder essentially glyceryl tri(acetoxystearate).

3. A capacitor comprising a pair of electrically conductive electrodes and a dielectric separating the electrodes, the dielectric including a plastic film and the dielectric fluid of claim 1.

4,521,827

HEAT SINK MOUNTING

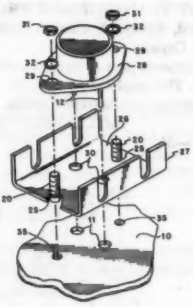
William D. Jordan, Dallas; Roger C. Hundt, Carrollton, and James D. Pritchett, Plano, all of Tex., assignors to Thermalloy, Inc., Dallas, Tex.

Division of Ser. No. 314,202, Oct. 23, 1981, Pat. No. 4,403,102, which is a continuation of Ser. No. 93,281, Nov. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 8,032, Jan. 31, 1979, abandoned. This application Jan. 12, 1983, Ser. No. 457,409

The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.

Int. Cl.³ H05K *7/20*; F28F *7/00*

U.S. Cl. 361—386 **10 Claims**



1. In combination:

(a) a heat sink including a substantially flat base portion; and

(b) at least one mounting stud comprising an elongated shaft with a radially enlarged portion extending radially therefrom intermediate the ends thereof forming the largest diameter of said stud, the end portion of said shaft on one side of said radially enlarged portion extending through a hole in said flat base portion and at least one end portion of said stud coated with a solder-promoting material.

9. In combination:

(a) at least one mounting stud comprising an elongated shaft

with an enlarged flange extending radially therefrom intermediate the ends thereof defining a shaft with a first portion extending in a first direction from said flange and a second portion extending in the opposite direction from said flange, said flange forming the largest diameter of said stud;

(b) a circuit board with at least the end of said second portion of said shaft fitted within a hole in said circuit board and soldered to said circuit board; and

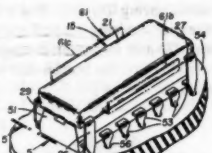
(c) part of said second portion of said shaft between said flange and said end portion thereof fitted within the hole in said circuit board enlarged with respect to the end fitted within said circuit board; thereby forming a shoulder for resting on the surface of said circuit board and spacing said flange from the surface of said circuit board.

4,521,828

COMPONENT MODULE FOR PIGGYBACK MOUNTING ON A CIRCUIT PACKAGE HAVING DUAL-IN-LINE LEADS

William J. Fanning, Glen Ellyn, Ill., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,662
Int. Cl.³ H05K 7/20
U.S. Cl. 361—386 **21 Claims**



1. A component module comprising:

a molded housing having a base with four corners;

a component encapsulated within said housing and having first and second electrodes;

a first terminal including an upper portion having a preformed integral bracket means frictionally engaging at least a portion of said first component electrode, and at least partially embedded in said housing, and a lower portion that projects downwardly from a region adjacent one predetermined base-defined corner of said housing in close proximity to said first component electrode; and

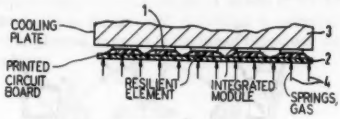
a second terminal including an upper portion having a preformed integral bracket means for frictionally engaging at least a portion of said second component electrode, and at least partially embedded in said housing, and a lower portion that projects downwardly from a region adjacent the base-defined corner of said housing that is diagonally disposed from said one predetermined first terminal corner thereof, the lower portion of said first and second terminals being spaced so as to respectively contact selected correspondingly disposed leads of an associated integrated circuit package, having dual-in-line leads, when said component module is subsequently piggyback-mounted thereon.

4,521,829

DEVICE FOR COOLING A PLURALITY OF INTEGRATED MODULES COMBINED ON A RIGID PRINTED CIRCUITBOARD TO FORM LOGIC CARDS

Herrmann Wessely, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 25, 1983, Ser. No. 526,372
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 3233491
Int. Cl.³ H05K 7/20
U.S. Cl. 361—387 **7 Claims**



1. A device which cools a plurality of integrated modules, comprising:

a rigid printed circuitboard;

a plurality of integrated modules carried on said rigid printed circuitboard, each of said modules including a planar rear surface facing away from said printed circuitboard;

a common cooling plate including a highly-planar surface contacting each of said rear surfaces;

pressure means acting on said rigid printed circuitboard to press said modules against said cooling plate; and

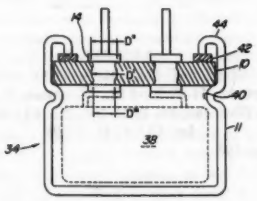
a plurality of resilient means individually disposed between said rigid printed circuitboard and said modules to individually press said modules against said cooling plate.

4,521,830

LOW LEAKAGE CAPACITOR HEADER AND MANUFACTURING METHOD THEREFOR

William H. Aultman, Pickens, and Morris T. Reese, Taylors, both of S.C., assignors to Sangamo Weston, Inc., Norcross, Ga.

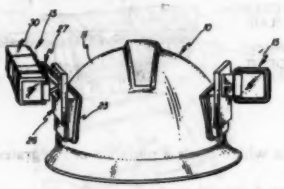
Division of Ser. No. 334,289, Dec. 24, 1981, Pat. No. 4,458,414. This application Apr. 30, 1984, Ser. No. 605,440
Int. Cl.³ H01G 9/00
U.S. Cl. 361—433 **4 Claims**



1. A capacitor header for sealing a container open to one end thereof, comprising: a header disposed within and sized to close said open end of said container, said header having the mechanical characteristics of a modulus of elasticity in the range from 50,000 to 200,000 psi and a tensile strength in the range from 3,500 to 80,000 psi, said header having at least one through hole provided therein having a predetermined diameter; and at least one cylindrical terminal formed as a solid, unitary body from an electrically conductive material and having a modulus of elasticity in the range from 2 million to 11 million pounds per square inch and a yield strength in the range from 10,000 to 80,000 psi, said terminal being disposed in said through hole and extending therefrom, said terminal having a portion in contact with said through hole with a diameter

in the range of 0.002 to 0.020 inch larger than said predetermined diameter.

4,521,831
PROTECTIVE HELMET WITH DUAL ADJUSTMENT ILLUMINATION MEANS
John R. Thayer, Ridge Rd., Fabius, N.Y. 13063
Filed Jan. 18, 1984, Ser. No. 571,786
Int. Cl.³ F21L *15/14*; A42B *3/00*
U.S. Cl. 362—32 9 Claims



1. In a protective helmet having two sidewalls and an adjustable visor connected to the front thereof for shielding the wearer's face, illuminating apparatus for directing independent beams of light at selective targets at either the front or the rear of the helmet that includes

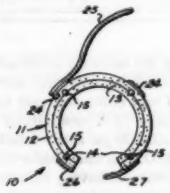
a base member projected outwardly from each sidewall of the helmet, each base member having a guideway formed therein,

a removable carriage having rail means slidably received in the guideway of each base member for detachably securing the carriage in said base,

a lamp support pivotally mounted in each carriage for rotating a lamp mounted therein within a vertical plane adjacent the base, and

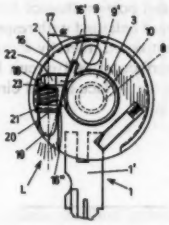
an indexing means acting between each carriage and the associated lamp support for releasably positioning the support within said plane whereby each lamp can be independently directed toward separate targets to either the front or the rear of the helmet without interfering with the adjustable visor.

4,521,832
WRIST STRAP ILLUMINATING DEVICE
Bruce E. Barbour, 41-37 52nd St., Woodside, N.Y. 11377
Filed Jun. 18, 1984, Ser. No. 622,003
Int. Cl.³ F21L *15/08*
U.S. Cl. 362—103 2 Claims



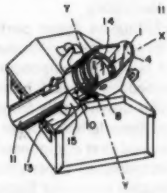
1. A wrist strap illuminating device, comprising, in combination, a main body, an electrical circuit received in said main body with a battery, battery snap switch means received in said main body and a plurality of mating velcro fastener strips secured to said main body.

4,521,833
LIGHT
Heinz Wolter, Meiswinkel 3, D-5067 Kürten, Fed. Rep. of Germany
Filed Aug. 17, 1984, Ser. No. 642,001
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1983, 3330179
Int. Cl.³ F21V *33/00*
U.S. Cl. 362—116 10 Claims



1. A light, within whose handle-forming plastic housing (2) a button-cell battery (3) provided with a circumferential and a center surface pole can be brought into the switch-contact position against the force of a compression spring (6), a portion of the center surface pole (MP) of the button-cell battery coming into contact with a portion of a ring-shaped contact blade (9), the compression spring being arranged concentrically to the ring-shaped section (9') which rests on the housing bottom (7) and the circumferential pole of the button-cell battery being in continuous contact (permanent contact) with a contact spring (16) which extends tangentially to the button-cell battery, the width of which spring corresponds at least to the stroke of the button-cell battery, characterized by the fact that the compression spring (6) lies, free of contact, in the opening (10) of the circular ring-shaped section (9') lying on the housing bottom (7) and in switch-contact position of the central-surface pole (MP) of the button-cell battery (3) comes onto the ring-shaped section (9').

4,521,834
ADJUSTABLE REFLECTOR FOR ILLUMINATING DEVICES
Allie E. Orr, 103 Stonewall Rd., Warner Robins, Ga. 31093
Filed Nov. 2, 1983, Ser. No. 547,973
Int. Cl.³ F21V *33/00*
U.S. Cl. 362—139 21 Claims



1. An adjustable light reflector for illuminating devices comprising:

(a) a collar means receiver made onto, or attached thereupon, the casing of an illuminating device, said device provided with a light emitting source, said collar means receiver having a generally cylindrical surface in order to rotatably but frictionally receive a collar means so as to allow both rotary movement and position holding capabilities of the collar means over the collar means receiver on an axis generally concentric to the collar means receiver,

said axis henceforth to be referred to as the X axis, so as to provide, ultimately, a reflective surface with both rotary movement and position holding capabilities on the said X axis; and

(b) a collar means being rotatably but frictionally engaged over the collar means receiver, wherein the collar means has two rotatable attaching means made thereonto, each said rotatable attaching means being rotatably but frictionally engaged with a rotatable attaching means receiver so as to provide, ultimately, the reflective surface with rotary movement and position holding capabilities on an axis established by a line connecting the rotational centers of each of the two said rotatable attaching means to the other, said axis to be henceforth referred to as the Y axis; and

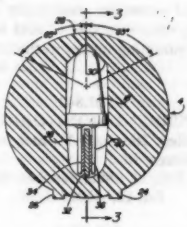
(c) a hood having a reflective surface on the underside of a top surface, two arms attached to either side of the top surface, said arms extending downward from the top surface, each having a rotatable attaching means receiver made onto the arm lower end, wherein each said rotatable attaching means receiver is rotatably but frictionally engaged with a rotatable attaching means, wherein the reflective surface has both rotary movement and position holding capabilities on both the X and Y axes, wherein a moving reflective surface will be presented to a portion, or more, of light rays being emitted from the illuminating device light emitting source during some portion, or more, of rotational movement of the hood on the X axis and on the Y axis, wherein the hood can be rotated on the Y axis between two limits, said limits occurring when the hood, rotated in either direction, contacts the casing, wherein one limit constitutes a hood position hereby defined as the stow position, wherein the reflector mechanism is arranged so as to be clear of the emitted light rays and also not to extend beyond the illuminating device in either direction along the X axis when in said stow position.

4,521,835

FLEXIBLE ELONGATED LIGHTING SYSTEM

Daniel H. Meggs, La Mirada; Herbert G. Gross, Santa Ana, and John T. Greenslade, El Toro, all of Calif., assignors to Gulf & Western, Southfield, Mich.

Filed May 17, 1983, Ser. No. 495,263
Int. Cl.³ F21V *21/00, 5/02*; B64D *47/02*
U.S. Cl. 362—183 **17 Claims**



1. A non-land vehicles lightweight emergency lighting system, comprising:

an extruded, elongated, approximately tubular, flexible waterproof housing member having a hollow interior with an upper light transmission portion of a cross-sectional variable thickness, the optical refraction characteristics of the upper light transmission portion providing a directional transmission of light towards a predetermined field angle extending traversely to a longitudinal axis of the housing member that is substantially less than 360°, and a lower mounting portion of a different configuration, the upper and lower portions extending substantially along the entire length of the housing member;

a plurality of light-emitting diodes positioned within the hollow interior of the housing member on a plane intersecting the housing member longitudinal axis and the middle of the upper light transmission portion and spaced along the longitudinal axis of the housing member;

an approximately flat bus strip mounting the light-emitting diodes along one edge and providing common electrical connections to each diode, the bus strip being laterally flexible perpendicular to the plane, the lower portion of the housing member supporting the bus strip so that the light-emitting surfaces of the diodes are operatively positioned adjacent the upper portion of the housing member to primarily distribute the light emitted from the diodes within the predetermined field angle, and

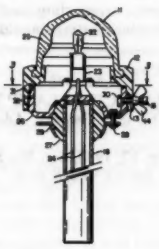
means for providing a pulsed electrical power to illuminate the light-emitting diodes and providing a perceptively constant brightness to prolong the life of the power during an emergency.

4,521,836

ELEVATED AIRPORT RUNWAY, TAXIWAY, OR THRESHOLD EDGE LIGHT WITH SEALED GLASS DOME

Louis Puttemanns, 24 Saint Paulus La., Tervuren 1981, and Jean J. R. Plas, 2 Clos des Trotteurs, Wezembeek 1970, both of Belgium

Filed Jun. 25, 1984, Ser. No. 624,152
Int. Cl.³ F21S *1/14*
U.S. Cl. 362—145 **7 Claims**



1. An elevated airport runway, taxiway, or threshold light comprising

a substantially hollow base having a bottom wall,

a ball joint centrally positioned in the bottom wall of said base and adapted to receive an upstanding conduit, said ball joint comprising adjustable securing means for fixedly positioning said base and said ball joint onto said upstanding conduit,

means supported centrally on said base adapted to receive a light source, and

a cover comprising a lower annular portion and a hollow glass dome including a prism portion sealed in said lower annular portion, said lower annular portion having an inner base portion resting on the upper portion of said hollow base,

whereby the apex of said hollow glass dome is positioned a predetermined distance from said inner base portion and said bottom wall of said base, so that the prism portion is in proper registration with respect to said light source.

4,521,837

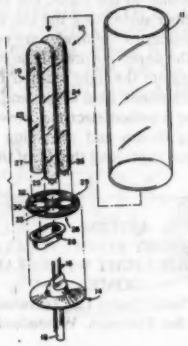
COMPACT FLUORESCENT LAMP HAVING INCREASED LIGHT OUTPUT

Andre C. Bouchard, Peabody, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 20, 1984, Ser. No. 622,361
Int. Cl.³ F21S *5/00*
U.S. Cl. 362—216 **3 Claims**

1. A fluorescent lamp comprising: an hermetically sealed outer envelope containing an arc generating and sustaining

medium; an assembly positioned within said envelope, said assembly comprising a pair of U shaped tubes coated on their interior surface with a phosphor, each of said tubes having an electrode end carrying an electrode and an open end; and an arc directing means operatively associated with said ends of



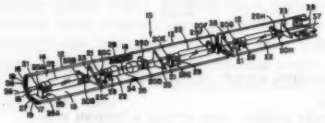
said tubes, said arc directing means comprising a base member mounting said tubes, said base member having a first planar surface facing said tubes and a second planar surface which includes an arc director connecting said open ends of said tubes; and a light reflecting coating on said first planar surface.

4,521,838

TUBULAR ELECTRIC LAMP FIXTURE

Youri Agabekov, 54 bis quai Gustave, Ador, Geneva, Switzerland 1207

Filed Jun. 17, 1983, Ser. No. 502,682
Int. Cl.³ F21S *3/00*
U.S. Cl. 362—219 **3 Claims**



1. A fixture for a plurality of tubular electric lamps, said fixture comprising:

an elongated frame of generally L-shaped cross-section formed of insulating material and comprising a pair of longitudinally extending flanges substantially at right angles to each other, each of said flanges having a front side and a back side, each of said back sides having a groove extending longitudinally the entire length of each of said back sides;

a first and second electrically conductive flat metal bar each having a plurality of integral foldable lamp carrying tabs perpendicularly upstandable from the center of said bars, said tabs having been stamped from the center of said bars, said tabs spaced along the entire length of said metal bars, one such bar extending longitudinally in and lying flat against said groove in said back side of each said flange of said frame such that when tabs are folded upstanding and perpendicular such tabs project through spaced slots along said flange;

said tabs further longitudinally spaced along said fixture such that said tabs in first said bar cooperate with said tabs in said second bar so as to be capable of supporting at least one of said lamps in a position substantially parallel to, overlying, and spaced from said front side of said flanges with an axis lying substantially on the line of juncture of two projected longitudinal planes, one of which planes also includes the longitudinal center line of one of said bars and the other of which planes also includes the longitudinal center line of the other said bar;

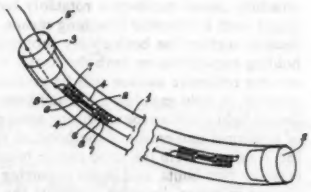
a pair of self-adhesive bands, one such band extending longitudinally along the back side of each of said flanges and overlapping said flat metal bars for electrical insulation thereby securing one of said flat metal bars in each of said grooves of each of said back side of said flanges.

4,521,839

STRIP LIGHTING SYSTEM

Brian A. Cook, 13316 Avenida La Valencia, Poway, Calif. 92064, and Philip G. Quintin, 22 Carpenters Ct., Bodmin, Cornwall, England

Filed Feb. 9, 1984, Ser. No. 578,775
Int. Cl.³ F21V *1/00*
U.S. Cl. 362—238 **10 Claims**



1. A strip lighting system comprising a flexible tube of waterproof material, a string of electrically connected light bulbs contained within said tube and spaced from the wall of the tube to allow flexing of the tube;

means for releasably sealing each end of the tube, means for connecting said string of light bulbs to an electrical power source;

a pair of wire leads extending in parallel along the length of the tube;

means for releasably connecting the light bulbs separately at spaced intervals in parallel across the wire leads,

each light bulb being elongate and having an electrical contact at each end;

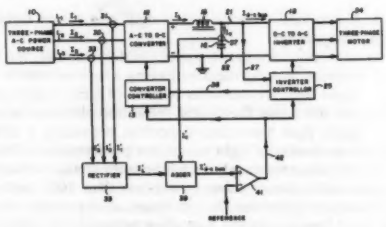
each light bulb connecting means comprising contact mounting means or releasably receiving opposite ends of a light bulb, and means for electrically connecting one of said mounting means to one of said wire leads and the other of said mounting means to the other wire lead.

4,521,840

D-C BUS CURRENT MONITORING SYSTEM

Frederick L. Hoadley, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 14, 1983, Ser. No. 466,267
Int. Cl.³ H02J *3/36*
U.S. Cl. 363—35 **11 Claims**



1. A monitoring system for monitoring the d-c bus current supplied over a d-c bus to an inverter and received through a

low pass filter, having a series-connected filter choke and a shunt-connected filter capacitor, from the output of an a-c to d-c converter, to the input of which converter is applied a-c energy, said monitoring system comprising:

input current sensing means, including at least one a-c current transformer and a rectifier, for sensing the a-c input current to the converter and deriving a d-c signal which is proportional to the d-c current produced at the output of the converter;

capacitor current sensing means, including an a-c current transformer, for sensing the filter capacitor current to derive an a-c signal proportional thereto;

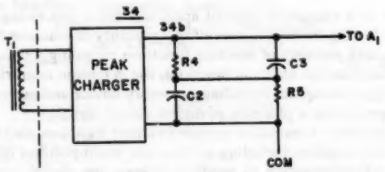
and adding means for adding the two derived signals to produce a d-c signal which is directly proportional to, and very accurately represents, the d-c bus current.

4,521,841

PEAK CHARGING CIRCUIT PROVIDING FOR IMPROVED LOOP GAIN AND COMMON MODE NOISE REJECTION

Neil A. Kamiller, Lakewood, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Jul. 28, 1982, Ser. No. 402,629
Int. Cl.³ H02M *1/14*
U.S. Cl. 363—45 **8 Claims**



1. An a-c gain increasing circuit for use in the current control loop of a power supply of the type which includes a switchable power generating means and controls the current in said switchable power means when the amplitude of a signal representative of that current exceeds a predetermined reference said supply including means to sense the current and generate said representative signal, said circuit comprising:

(a) peak charging means responsive to said representative signal for generating a d-c signal whose amplitude is a function of said switchable power means current;

(b) discharge/charge storage means responsive to said peak charging means signal for storing said d-c signal; and

(c) loop gain increasing means connected in series combination with said discharge/charge storage means, said series combination being connected in parallel with said peak charging means, said loop gain increasing means responsive to said peak charging means signal for increasing the a-c gain of said current control loop.

4,521,842

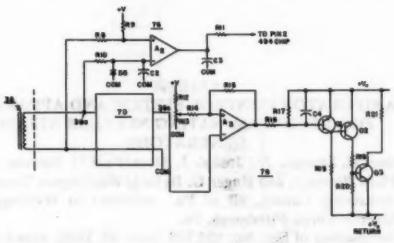
CIRCUIT FOR CONTROLLING THE VOLT-AMPERE CHARACTERISTIC OF A LOAD SHARING POWER SUPPLY AT NO LOAD AND FOR INSERTING A PRELOAD

Neil A. Kammiller, Lakewood, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

Division of Ser. No. 402,633, Jul. 28, 1982, Pat. No. 4,468,722. This application Mar. 21, 1984, Ser. No. 591,779
Int. Cl.³ H02P *13/22*
U.S. Cl. 363—71 **11 Claims**

1. A circuit for use in a power supply to control the supply's volt-ampere characteristic in the region where the external load connected to the output of said supply falls between some predetermined relatively small amount and no load such that at least two of said supplies may be connected to said external load so that in said region false indications of malfunctions in supply operation do not arise from said connection said supply having an associated series diode for connecting said output to said external load said supply including means responsive to the voltage across said load and a reference signal to regulate said voltage, said voltage reference signal having a first amplitude when said external load is greater than said predetermined amount and having a second amplitude when said external load falls between said predetermined amount and no load, said circuit comprising:

(a) means for inserting in parallel with said external load a preload, said means including first means responsive to said supply output current and a reference signal representing a first predetermined amplitude of said output



current for generating a signal to connect said preload in parallel with said external load when said output current falls below said first predetermined amplitude and switching means responsive to said connecting signal for inserting said preload; and

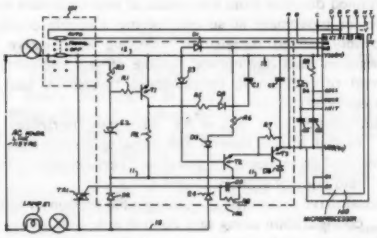
(b) means responsive to the output current of said supply to derive a signal representative thereof and a reference signal having an amplitude representative of said relatively small external load to change said voltage reference signal to said second amplitude when said output current representative signal falls below said signal representative of said relatively small external load to thereby control the volt-ampere characteristic in said region.

4,521,843

PROGRAMMABLE WALL SWITCH FOR CONTROLLING LIGHTING TIMES AND LOADS

Donald E. Pezzolo, Cupertino; James W. Pfeiffer, Santa Clara, and Thomas E. Corder, Martinez, all of Calif., assignors to Intermatic Incorporated, Spring Grove, Ill.

Filed Aug. 16, 1982, Ser. No. 408,330
Int. Cl.³ G01R *21/00*; G06F *15/06*
U.S. Cl. 364—145 **17 Claims**



1. A programmable wall switch for controlling the time for turning on and for turning off a light which comprises:

means for producing from the AC power line a selected DC voltage;

microprocessor means powered by said DC voltage, for turning on a light at any one of several selected times and

for turning off said light at any one of an additional corresponding several selected times, said microprocessor means including means for incrementing said one of several selected times and one of said additional corresponding selected times by random amounts; and

means, responsive to signals from said microprocessor means, for displaying the time.

4,521,844

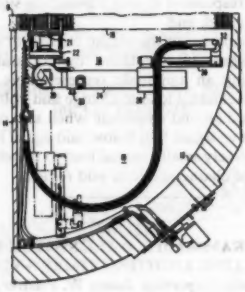
MANIPULATOR CONTROL SYSTEM AND APPARATUS FOR DECONTAMINATING NUCLEAR STEAM GENERATORS

Robert H. Sturges, Jr.; Joseph J. Birsa; Paul H. Dawson, all of Plum Borough, and Roger G. Byford, Washington Township, Armstrong County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 154,703, May 30, 1980, abandoned. This application Jun. 3, 1982, Ser. No. 384,691

Int. Cl.³ G06F *15/46*; B24C *3/32*

U.S. Cl. 364—167 19 Claims



1. A control system for adaptably controlling movement of a control arm in a generally curved enclosure of a nuclear steam generator, said control arm being removably attached at a pivot end to a pivot mechanism fixed in location a first predetermined distance from the center of said enclosure and being free for movement at an end having a nozzle configuration movably affixed thereto for directing an abrasive mixture toward at least one curved surface of said enclosure for removal of radioactive contaminates therefrom, said control system comprising:

horizontal drive means for governing horizontal pivotal motion of said control arm about said pivot end;

vertical drive means for governing vertical pivotal motion of said control arm about said pivot end;

axial drive means for governing axial motion of said nozzle configuration along said control arm; and

automatic control means connected to said horizontal, vertical, and axial drive means for automatically controlling both the position of said nozzle configuration relative to said center and the angular velocity of said control arm so as to control the spacing of said nozzle configuration from said surface and the tangential velocity at which said nozzle configuration moves over said surface so as to provide substantially uniform cleaning of said surface.

4,521,845

NUMERICAL CONTROL DEVICE

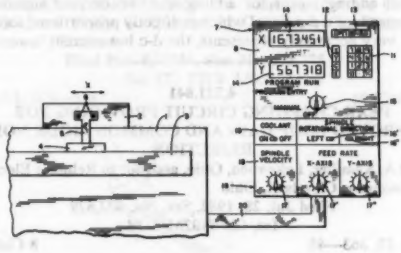
Ernst Schwefel, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Continuation of Ser. No. 39,146, May 15, 1979, abandoned. This application Jun. 22, 1981, Ser. No. 275,747

Claims priority, application Fed. Rep. of Germany, May 19, 1978, 2821843

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—171 20 Claims



20. In a numerical control apparatus for a processing machine having means for executing a plurality of machine functions, said plurality of machine functions including a plurality of miscellaneous machine functions, the invention comprising:

a digital computer including a memory device and means for generating a plurality of digital output signals;

a plurality of manually operated control switches, said control switches including at least one multi-position digital switch operative to produce at least one digital control signal and at least one analog switch operative to produce at least one analog control signal, each control switch associated with one of the plurality of miscellaneous machine functions such that said control switches are operable independent of programming codes, said plurality of manually operated control switches selectively operable during computer-controlled processing of a workpiece for generating at the selected time the associated miscellaneous machine functions;

input and output interfacing means, included in the computer, for interfacing the control switches with the computer and for interfacing the computer with the executing means such that the executing means is responsive to the plurality of output signals to selectively activate and deactivate the plurality of machine functions, said input and output interfacing means including analog-to-digital converter means for digitizing the at least one analog control signal;

first means, included in the computer, for reading the instantaneous state of the control switches during continuous computer-controlled processing of a first workpiece according to processing information stored in the memory device, for storing said states in the memory device during continuous computer-controlled processing of the first workpiece, and for setting said output signals to activate and deactivate the miscellaneous machine functions to correspond to the instantaneous states of the control switches during processing of the first workpiece;

second means, included in the computer, for setting said output signals during computer-controlled processing of additional workpieces, subsequent to processing of the first workpiece, in accordance with previously stored states of the control switches and independent of the instantaneous states of the control switches, such that the miscellaneous machine functions are automatically controlled in the processing of the additional workpieces to duplicate the processing of the first workpiece;

third means, included in the computer, for setting said out-

put signals to correspond to the instantaneous states of the control switches without modifying the control switch state information stored in the memory device such that the miscellaneous machine functions can be manually controlled during the computer-controlled processing of a workpiece without disturbing the contents of the memory device; and

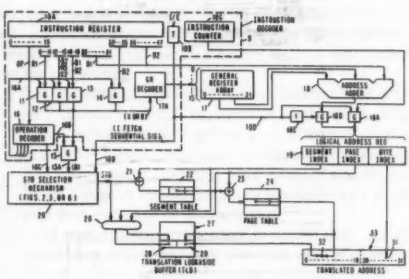
mode designating switch means for selecting one of the first, second, and third means.

4,521,846

MECHANISM FOR ACCESSING MULTIPLE VIRTUAL ADDRESS SPACES

Casper A. Scalzi, Poughkeepsie, and Richard J. Schmalz, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 20, 1981, Ser. No. 236,387
Int. Cl.³ G06F *9/10, 9/16*
U.S. Cl. 364—200 **23 Claims**



1. Addressing control means in a data processor having a predetermined number of general purpose registers (GRs), any of which may be assigned as a base GR to provide a base address within an address space, an instruction decoder in the processor for providing a base GR address signal that represents the GR address for one of the GRs which contains a base value for a calculation of an effective logical address of a storage operand of an instruction, comprising:

an address space mask register having a plurality of digit positions, the digit positions in the mask register corresponding to the respective GR addresses,

a plurality of address space designating registers, each designating register having an address,

means for loading one or more predetermined digit positions of the mask register with the address(es) of the designating registers to assign one of the designating registers to a particular GR,

means for selecting a digit position in the mask register in response to a base GR address signal from the instruction decoder, the content of the digit position selecting the designating register assigned by the loading means to the digit position,

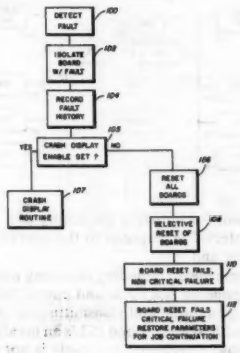
whereby the GR address represented by the base GR address signal selects an address space designated by the content of the selected designating register.

4,521,847

CONTROL SYSTEM JOB RECOVERY AFTER A MALFUNCTION

Richard T. Ziehm, Webster; Stephen P. Wilczek, Fairport; George E. Baker; Raymond R. Husted, both of Rochester; Glen A. Dumas, Henrietta; Keith G. Bunker, Rochester, and George H. Place, Jr., Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 420,995
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—184 **12 Claims**



12. In a machine control having a plurality of control processors including a master processor with a memory for continually storing machine status information and at least one remote processor providing coded transmissions, the master processor memory maintaining status information associated with said remote processor, a method of recovery from a machine malfunction comprising the steps of

(1) the master processor recognizing the existence of a malfunction,

(2) the master processor identifying the remote processor being the source of the malfunction through a coded transmission from the remote processor,

(3) the master processor initializing said remote processor without destroying the status information of the master processor memory,

(4) the master processor downloading the status information from the master processor memory associated with said remote processor to the remote processor after receiving the coded transmission, and

(5) continuing machine operation without loss of machine status in the remote processor.

4,521,848

INTERSYSTEM FAULT DETECTION AND BUS CYCLE COMPLETION LOGIC SYSTEM

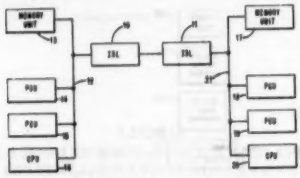
Kenneth E. Bruce, Nashua, N.H.; Ralph M. Lombardo, Jr., Lowell, Mass.; Bruce H. Tarbox, Billerica, Mass., and John W. Conway, Waltham, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 956,386, Oct. 31, 1978, abandoned. This application Aug. 27, 1981, Ser. No. 296,931
Int. Cl.³ G06F *3/04, 9/46*
U.S. Cl. 364—200 **11 Claims**

1. Communication apparatus for use in a data processing system having plural intersystem communication links (ISL's) for accommodating the transfer of information between plural communication busses, each providing a common information path for data processing devices electrically interfacing therewith, and wherein each of said plural communication busses is in electrical communication with an ISL and ISL's are connected in pairs, comprising:

(a) interface logic means coupling first and second ones of said ISL's to local and remote communication busses, respectively, enabling the transfer of data and control signals therebetween;

(b) first logic means responsive to a data read request initiated from a requesting device coupled to said remote communication bus through means including said first and second ISL's for controlling said interface logic means to apply said data read request to said local bus calling for generation of a responding bus cycle from a target device coupled to said local bus;



(c) timer means for initiating the timing of a predetermined time-out interval in response to the operation of said first logic means; and

(d) second logic means including detecting means responsive to said responding bus cycle and controlled by said timer means for generating and transmitting to said remote bus through said first and second ISL's an invalid data word in the event said responding bus cycle is not detected prior to termination of said time-out interval, whereby said invalid data word signals the existence of an error condition to said requesting device.

4,521,849

PROGRAMMABLE HIT MATRICES USED IN A HARDWARE MONITORING INTERFACE UNIT

Richard P. Wilder, Jr., North Billerica, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 1, 1981, Ser. No. 307,566

Int. Cl.³ G06F *7/00, 9/00*

U.S. Cl. 364—200 **6 Claims**

1. A data processing system including a main memory subsystem, a plurality of I/O controllers, a central processing unit (CPU) and a cache memory, all coupled in common to a system bus, the system comprising:

a monitor interface unit coupled to said system bus, said central processor unit by a CPU bus, and said cache memory by a cache bus for monitoring information signals and transferring hit signals representative of predetermined signals of said information signals to monitors for generating performance data, said monitor interface unit comprising:

bus selection means for selecting said information signals from said system bus or from said cache bus; wherein said bus selection means comprises:

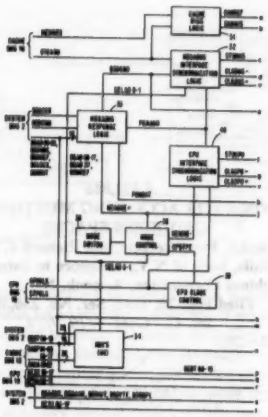
mode switching means for generating a selection signal for selecting said information signals from said system bus or said cache bus; and

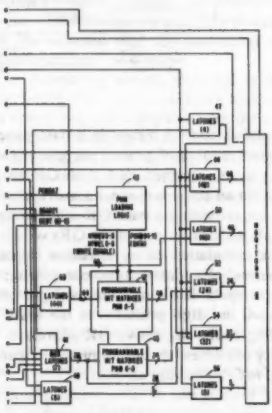
multiplexer means coupled to said mode switching means and responsive to said selecting signal in a first state for selecting system bus signals representative of said information signals from said system bus and said selection signal in a second state for selecting cache bus signals representative of said information signals from said cache bus;

interface input storage means coupled to said bus selection means for temporarily storing said information signals from said system bus and said cache bus and coupled to said CPU for storing said information signals from said CPU bus; wherein said input storage means comprises:

input latch means coupled to said multiplexer means for storing said system bus signals when said multiplexer means is responsive to said system bus and storing said cache bus signals when said multiplexer means is responsive to said cache bus for generating a first set of address signals to the programmable hit matrix memory, and for storing CPU bus signals from said CPU bus for generating a second set of address signals to the programmable hit matrix memory;

programmable hit matrix memory coupled to said input storage means and addressable by said information signals from said interface input storage means for generating said





hit signals in response to said predetermined signals; and of said information signals; and

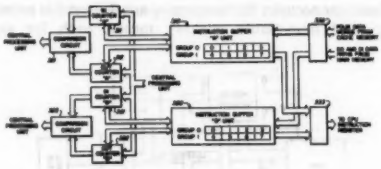
the system further comprising monitor means coupled to said output storage means and responsive to the hit signals for generating statistical data regarding ocurrence of said predetermined signals on the system bus, CPU bus and cache bus.

4,521,850

INSTRUCTION BUFFER ASSOCIATED WITH A CACHE MEMORY UNIT

John E. Wilhite, Glendale; William A. Shelly, and Charles P. Ryan, both of Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Continuation of Ser. No. 156,224, Jun. 30, 1980, abandoned, which is a continuation of Ser. No. 866,083, Dec. 30, 1977, abandoned. This application Oct. 4, 1982, Ser. No. 433,569
Int. Cl.[3] G06I *9/30*
U.S. Cl. 364—200 7 Claims



1. In a data processing system having a central processing unit, an instruction register, and an associated cache memory unit, buffer apparatus for a sequence of instructions being transferred from said cache memory unit to said instruction register comprising:

a first plurality of groups of storage locations for a temporary storage of a first sequence of instructions from said cache memory to be supplied to said instruction register;

first counter means, responsive to signals from said central processing unit, to indicate when a one of said first plurality of groups of storage locations has received a portion of said first sequence of instructions;

second counter means responsive to signals from said central processing unit, to indicate when contents of a preselected one of said first groups of storage locations has been transferred to said instruction register;

first comparison means responsive to signals from said first counter means and second counter means, said first comparison means signalling said central processing unit a status of said first plurality of groups of storage locations indicating which of said locations is available for signal storage;

a second plurality of groups of storage locations for temporary storage of groups of alternative sequence of instructions from said cache memory to be supplied to said instruction register;

third counter means, responsive to signals from said central processing unit, to indicate when a one of said second plurality of groups of storage locations has received a portion of said group alternative sequence of instructions from said cache memory;

fourth counter means, responsive to signals from said central processing unit, to indicate when said contents of a preselected one of said second group of storage locations had been transferred to said instruction register;

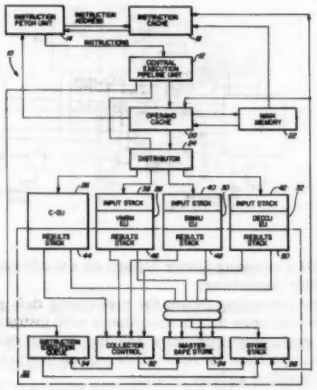
second comparison means responsive to signals from said third counter means and fourth counter means, said second comparison means signalling said central processing unit a status of said second group of storage locations wherein said status of said second plurality of group storage locations indicates which of the locations is available for signal storage.

4,521,851

CENTRAL PROCESSOR

Leonard G. Trubisky, Scottsdale, and William A. Shelly, Phoenix, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Oct. 13, 1982, Ser. No. 434,122
Int. Cl.[3] G06F *9/28, 9/38*
U.S. Cl. 364—200 6 Claims



1. A synchronous central processor for a general purpose digital data processing system, said central processor being synchronized by clock pulses produced by clock means and having a given repertoire of instructions, said processor comprising:

cache means adapted to store machine words, said machine words including instructions and operands;

a plurality of instruction execution units, each of which unit executes a different set of the instructions of the repertoire independently of and in parallel with one another, each instruction requiring a predetermined number of clock periods to complete and each execution unit having a results stack into which the result of the execution of each instruction is stored;

instruction fetch means for fetching instructions from the cache means and for queuing instructions awaiting execution;

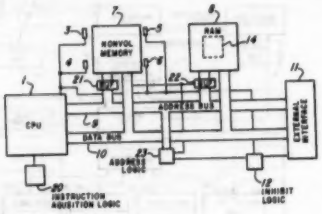
central unit means for obtaining instructions of a given program from the instruction fetch means in program order, for decoding the instructions, for preparing the address of an operand to be operated upon by the instruction, for checking to determine if the addressed operand is stored in the cache means, for accessing the addressed operand from the cache and for dispatching the instruction and its operand to the one of said plurality of instruction execution units for executing it, each of said instruction execution units executing the instructions dispatched to it in the order received to produce a result and storing the result of the execution of each instruction in its results stack in the order of execution, the number of clock periods required to execute each instruction differing so that the results of the execution of instructions of a given program by the instruction execution units are not produced in program order; and

collector means for obtaining in program order the results of the execution of the instructions of the program from the results stacks of the instruction execution units and for writing into the cache means the results of the execution of instructions of the program which are to be written into memory in program order.

4,521,852
DATA PROCESSING DEVICE FORMED ON A SINGLE SEMICONDUCTOR SUBSTRATE HAVING SECURE MEMORY

Karl M. Guttag, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 30, 1982, Ser. No. 393,955
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—200 **4 Claims**



1. A data processing device formed on a single semiconductor substrate comprising:

a central processing means for preforming data processing operations upon data in accordance with instructions, said data processing operations including at least one memory access operation for recall of data or an instruction stored in a specified address location;

a nonvolatile memory means having a plurality of address locations which are a subset of the possible address locations of said at least one memory access operation, for storing data and instructions which define data processing operations at respective address locations;

an information transfer means connected to said central processing means and said nonvolatile memory means for transfer of data and instructions;

an external interface means connected to said information transfer means for providing information to at least one device external to said single semiconductor substrate;

at least one security bit memory means, each for storing therein a single bit of data indiating a secure state when said nonvolatile memory means is to be secure to a nonsecure sytate;

an address logic means connected to said information transfer bus for generating a protected access signal when a memory access operation specifies one of said address locations of said nonvolatile memory means; and

an external interface inhibit logic means connected to said at least one security bit memory means, said external interface means and said address logic means for inhibiting said external interface means thereby preventing transfer of information to said at least one external device when any of said at least one security bit memory means indicates said secure state and said address logic means generates said protected access signal.

4,521,853
SECURE MICROPROCESSOR/MICROCOMPUTER WITH SECURED MEMORY

Karl M. Guttag, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 30, 1982, Ser. No. 393,956
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—200 **3 Claims**

1. A data processing device formed on a single semiconductor substrate comprising:

a central processing means for performing data processing operations upon data in accordance with instructions, said data processing operations including at least one memory access operation for recall of data or an instruction stored in a specified address location;

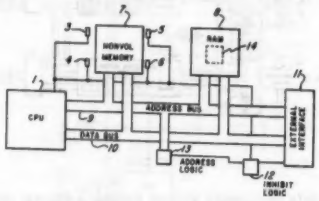
a nonvolatile memory means having a plurality of address locations which are a first subset of the possible address locations of said at least one memory access operation, for storing data and instructions which define data processing operations at respective address locations;

a temporary read-write memory means having a plurality of address locations which are a second subset of the possible address locations, said second subset including a secure set of address locations, for temporarily storing data and instructions which define data processing operations at respective address locations;

an information transfer means connected to said central processing means, said nonvolatile memory means and said temporary read-write memory means for transfer of data and instructions;

an external interface means connected to said information transfer means for providing information to at least one device external to said single semiconductor substrate;

at least one security bit memory means disposed in proximity to said nonvolatile memory means, each for storing



therein a single bit of data indicating a secure state when said nonvolatile memory means and said secure subset of memory locations of said temporary read-write memory means is to be secure or a nonsecure state;

address logic means connected to said central processing means, said information transfer means and said at least one security bit memory means for generating a security signal when said security bit memory means indicates a secure state and said central processing means is performing a data processing operation in accordance with an instruction including a memory access operation to recall data as an operand which is stored in either said nonvolatile memory means and or in said secure set of address locations of said temporary read-write memory means; and

an external interface inhibit means connected to said external interface means and said address logic means for inhibiting the transfer of data and instructions to the external device via said external interface means upon reception of said security signal.

4,521,854
CLOSED LOOP ELECTROSTATIC LEVITATION SYSTEM

Won-Kyu Rhim; Melvin M. Saffren, both of Pasadena, and Daniel D. Elleman, San Marino, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

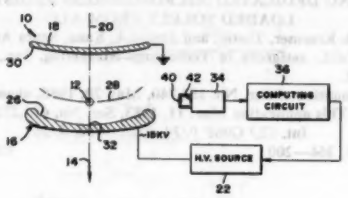
Filed Oct. 29, 1982, Ser. No. 437,912
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—400 **5 Claims**

5. Apparatus for electrostatically levitating a charged object, comprising:

a lower electrode, and an upper electrode lying a predetermined distance above said lower electrode;

means for applying a voltage to said lower electrode to apply an electrostatic force to an object lying a small distance above the lower electrode, and for applying a lower voltage to said upper electrode than to said lower one;

said lower electrode having a concave dish-shaped surface facing upwardly and said upper electrode having a convex



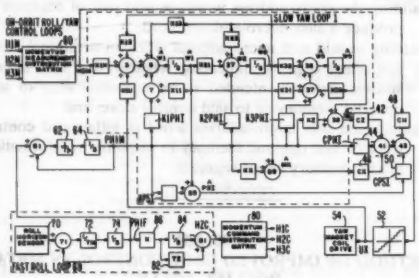
surface facing downwardly toward said lower electrode, whereby to urge the object toward a position directly above the lowermost portion of the concave surface.

4,521,855

ELECTRONIC ON-ORBIT ROLL/YAW SATELLITE CONTROL

John A. Lehner, Sunnyvale, and Kenneth L. Lebsock, Manhattan Beach, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Jul. 27, 1981, Ser. No. 288,230
Int. Cl.³ B64G *1/10*
U.S. Cl. 364—434 **11 Claims**



1. In an orbiting satellite having a stored momentum system for stabilizing the attitude of the satellite about orthogonal roll, pitch, and yaw axes, apparatus for estimating and directly correcting yaw error, said apparatus comprising:

at least one momentum wheel having a component of momentum about the yaw axis;

means situated on board the satellite for measuring the angular error of the satellite body with respect to the roll axis, said means generating a signal corresponding to said roll error;

coupled to said roll error measuring means and to said momentum wheel, means comprising solely electronic components for estimating the angular error of the satellite body with respect to the yaw axis from the roll error signal and from a measured component of momentum about the yaw axis; and

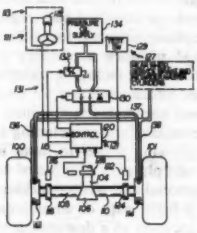
coupled to an output of said yaw error estimating means, means for continuously and directly correcting said yaw error during the satellite's orbit.

4,521,856

MULTIPLE THRESHOLD WHEEL SLIP CONTROL APPARATUS AND METHOD

Weldon L. Phelps, Dunlap, and Alan L. Stahl, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 1, 1984, Ser. No. 605,757
Int. Cl.³ G06F *15/20*; B60T *8/10*
U.S. Cl. 364—426 **16 Claims**



12. A vehicle anti-spin system, comprising:

a vehicle power source;

a differential mechanism (**106**) connected to said power source;

first and second wheels (**100,101**) connected to said differential mechanism (**106**);

a respective braking mechanism (**112,114**) connected to each of said wheels (**100,101**);

a steering mechanism (**111**) connected to said vehicle;

means (**115**) for producing a slip signal having a value responsive to the difference in rotational velocity between said wheels (**100,101**), said slip signal producing means (**115**) including respective wheel speed transducers (**116,122**) connected to each of said vehicle wheels (**100,101**);

a switch (**129**) connected to said vehicle and adapted to produce a test signal;

processor means (**121**) for receiving said slip signal and said test signal, comparing said slip signal value with a first predetermined reference value in response to receiving said slip signal in the absence of said test signal, said first predetermined reference value being greater than the largest value of said slip signal produced in response to steering said vehicle, comparing said slip signal value with a second predetermined reference value in response to receiving said slip signal and said test signal, said second predetermined reference value being less than the largest value of said slip signal produced in response to steering said vehicle, and producing a brake control signal in response to said slip signal value exceeding the compared one of said first and second predetermined reference values; and

means (**131**) for receiving said brake control signal and controllably operating said braking mechanisms (**112,114**) in response to said received signal.

4,521,857

AVIATION WEATHER INFORMATION DISSEMINATION SYSTEM

Collins J. Reynolds, III, Denver, Colo., assignor to Avimage, Inc., Tucson, Ariz.

Filed May 17, 1982, Ser. No. 378,615
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—439 **6 Claims**

1. An aviation weather communication system comprising:

a plurality of terminals located at various geographic locations within a large geographic zone;

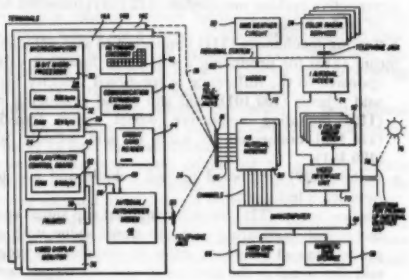
a regional weather-information accumulating station for communicating with sources of current pictorial and written weather information peculiar to locations in said

geographic zone and maintaining updated pictorial information and written weather messages cataloged according to the geographic locations to which the messages pertain;

each of said terminals having an interconnected system comprising a logic circuit means, both RAM and ROM memories, a display means and an auto-dial modem coupling its terminal to an existing telephone network in said geographic zone;

said regional station having an interconnected system comprising a logic circuit means, both RAM and ROM memories and modems coupling said regional station to said existing telephone network, for receiving and maintaining in said RAM memory a plurality of types of current weather information including pictorial and written-message weather information and for transmitting this information to said terminals upon request therefrom;

each of said terminals further including an information input means for allowing a user to input into said terminal a request for said plurality of types of weather information, including pictorial and written-message weather information, along a flight path of an anticipated flight from an originating location to a destination location in said geographic zone, the logic circuit of said terminal including a communication-logic means for automatically placing a call over said existing telephone network via said terminal auto-dial modem and one of said modems at said regional station to said regional station and thereafter transmitting said request for pictorial and written-message weather



information to said regional station in response to said user making such request at said terminal;

said logic circuit of said regional station including a logic means for responding to a request for pictorial and written-message weather information along said flight path by transmitting some of said requested pictorial information which said terminal receives and stores in its RAM memory, said terminal logic circuit means having the function of utilizing the display means and information input means, simultaneously with said terminal receiving said some pictorial information, for further interrogating said user concerning said anticipated flight and thereafter communicating information received from this interrogation to said regional station, said regional station logic circuit having the further function of utilizing flight originating location and destination location information transmitted to it by said terminal to automatically compute a tentative flight path between said originating and destination locations, and thereafter to identify locations proximate said tentative flight path for which particular written weather messages are maintained at said regional station, and to communicate said weather messages to said terminal from which said request for weather information was received in a particular sequence of said flight path starting with said origin location and continuing to said destination location, said terminal logic circuit having the further function of displaying the weather messages with the display means in this sequence.

4,521,858

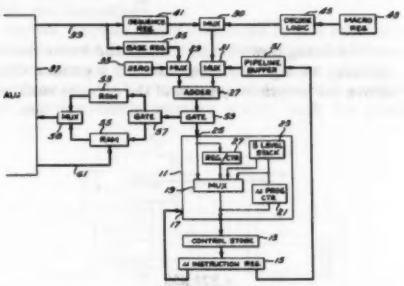
FLEXIBLE ADDRESSING AND SEQUENCING SYSTEM FOR OPERAND MEMORY AND CONTROL STORE USING DEDICATED MICRO-ADDRESS REGISTERS LOADED SOLELY FROM ALU

Alan D. Kraemer, Tustin, and James A. Kane, Santa Ana, both of Calif., assignors to Technology Marketing, Inc., Irvine, Calif.

Continuation of Ser. No. 151,740, May 20, 1980, abandoned. This application Mar. 11, 1983, Ser. No. 474,271

Int. Cl.[3] **G06F** *9/24, 9/28, 9/36, 9/26*

U.S. Cl. 364—200 **12 Claims**



7. A method of addressing an operand memory, and a control store which contains microinstructions which directly operate the hardware of a processor having an arithmetic logic unit and a pair of micro-address registers, comprising:

loading a different micro-address word, that forms a portion of a microinstruction address, into each of said pair of micro-address registers solely from said arithmetic logic unit;

adding the micro-address words in said pair of registers to produce a sum micro-address word;

adding to said sum micro-address word an additional memory select segment indicating whether said sum micro-address word is intended to be communicated to said operand memory or to said control store; and

gating said sum micro-address word to either said control store or said operand memory in response to information in said memory select segment.

4,521,859

METHOD OF IMPROVED GAGE CONTROL IN METAL ROLLING MILLS

Donald J. Fapiano, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Oct. 27, 1982, Ser. No. 436,973

Int. Cl.[3] **G06F** *15/46;* **B21B** *37/00*

U.S. Cl. 364—472 **5 Claims**

1. In a metal rolling mill including rotating rolls for reducing the thickness of a metal workpiece, roll gap adjusting means and automatic gage control means for controlling the roll gap adjusting means as a function of sensed roll separation force, a method for compensating for cyclic workpiece gage variations resulting from roll irregularities comprising:

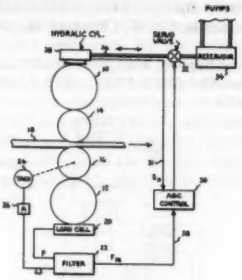
(a) developing a force signal proportional to the roll separation force occasioned by the workpiece between the rolls;

(b) developing a speed signal proportional to roll rotational speed;

(c) isolating, from said force signal, cyclic components having a frequency which is an integral multiple of the roll rotational speed;

(d) multiplying said cyclic components by a multiplication factor greater than unity to provide a product;

(e) subtracting said product from said force signal to provide a modified force signal; and,



(f) applying said modifying force signal to said automatic gage control means to thereby control the gap between said rolls.

4,521,860

METHODS OF ENTERING MACHINING INFORMATION AND DISPLAY THEREFOR IN A NUMERICALLY CONTROLLED MACHINE TOOL

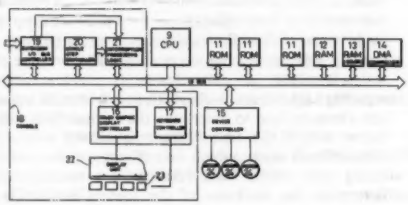
Hiroyuki Kanematsu, Konan; Akimitsu Nagae, Kasugai; Kiyohisa Mizoguchi, Nagoya, and Hajime Ohashi, Konan, all of Japan, assignors to Yamazaki Machinery Works, Ltd., Oguchi, Japan

Filed Aug. 30, 1982, Ser. No. 413,250

Claims priority, application Japan, Sep. 14, 1981, 56-145854; Oct. 15, 1981, 56-165936

Int. Cl.³ G06F *15/46*; G05B *19/18*

U.S. Cl. 364—474 **8 Claims**



1. In a numerically controlling machine tool, of the type having a computer, a display unit and a keyboard and controlled by a machining program and numerical information previously stored in the computer, a method of entering and displaying machining information necessary for machining a workpiece comprising the steps of:

inputting to the computer a machining mode of point, line, and face;

inputting into the computer numerical data representative of the finish machining contour of a workpiece specified in a corresponding engineering drawing;

classifying and computing the finish machining contour into machining modes of point, line and face;

subclassifying the respective machining modes into a plurality of machining units;

displaying machining information corresponding to the classified machining units on the display unit;

selecting and inputting into the computer machining information necessary for machining the workpiece; and

displaying condition of the workpiece being machined on the display unit, while computing a machining program corresponding to the inputted machining information.

4,521,861

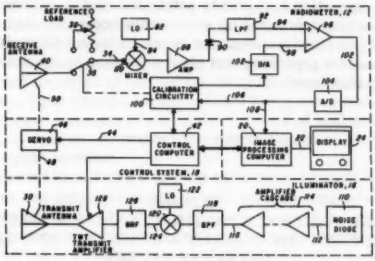
METHOD AND APPARATUS FOR ENHANCING RADIOMETRIC IMAGING

Russell H. Logan, Richardson, and Frank J. Poradish, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 30, 1982, Ser. No. 373,583

Int. Cl.³ G08C *9/00*; G01S *13/00, 15/00*; G06G *7/48*

U.S. Cl. 364—517 **7 Claims**



1. A radiometric imaging system for sensing electromagnetic energy from a target area, comprising:

an illuminator means comprising a transmit antenna and transmitter means for producing random electromagnetic energy for illuminating said target area;

a radiometer comprising a receive antenna and receiver means, said radiometer for receiving and measuring the intensities of both the illuminated thermal image as well as the non-illuminated passive image from said target area in a predetermined frequency band, and

means coupled to said radiometer for inverse filtering and subtracting the intensities of the non-illuminated target area from the intensities of the illuminated target area to provide enhanced target detection.

4,521,862

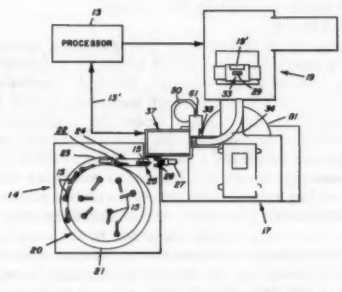
SERIALIZATION OF ELONGATED MEMBERS

Harold B. King, Wrightsville Beach; William Masaitis, Castle Hayne; Ernest Ippisch, and Albert E. Chinn, both of Wilmington, all of N.C., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 29, 1982, Ser. No. 363,094

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—552 **4 Claims**



1. The method for serializing nuclear fuel end plugs comprising the steps of:

(a) feeding a plurality of said end plugs individually to an output location of a feeder means for transporting said end plugs,

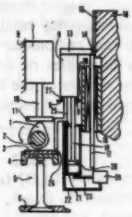
(b) transporting each said end plug from said feeder means by a robot including an arm and fingers,
(c) marking at least a single serial character onto said end plug with a marking means for marking serial characters,
(d) transferring said end plug from said marking means to an inspection site after marking has been completed,
(e) conducting an inspection of the nature and quality of said at least a single serial character marked on said end plug with a reader means for inspecting said nature and quality, and
(f) sorting said plurality of end plugs according to the results of the inspection in regard to nature and quality, wherein said sorting is conducted by a pneumatic means for delivering said end plugs to said reader means, including discriminating means for separating end plugs according to the results of said inspection.

4,521,863

GAUGE FOR CHECKING THE CLEARANCE EXISTING BETWEEN THE CAMS OF A CAMSHAFT AND THE RELEVANT VALVES

Sergio Solaroli, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Jul. 9, 1982, Ser. No. 396,894
Claims priority, application Italy, Jul. 17, 1981, 3481 A/81
Int. Cl.³ G01B *7/14;* F01L *1/20;* G01M *15/00*
U.S. Cl. 364—561 **13 Claims**



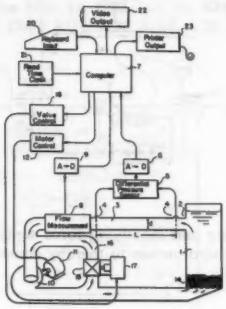
1. A gauge for checking the clearance existing between the cams of an engine camshaft and the associated valves, comprising:
support means;
drive means for rotating the camshaft;
control means;
gauging means including: a first measuring element movably coupled to the support means for undertaking, during rotation of the camshaft, positions responsive to the positions of a valve; a second measuring element movably coupled to the support means for contacting, during rotation of the camshaft, the surface of the cam associated with said valve; and a gauging device coupled to the first measuring element and the second measuring element for providing a signal indicative of the mutual position of said first measuring element and a second measuring element; and processing means connected to the gauging device for processing said signal during rotation of the camshaft and determining the amount of clearance between said valve and the associated cam; wherein the control means is coupled to the first measuring element for displacing it from a measurement position, where the first measuring element is arranged close at a side of said cam, to a rest position where the first measuring element is arranged apart from the path of displacement of said cam, during a part of the rotary movement of the cam.

4,521,864

MEASUREMENT OF BUILD-UP OF FOULING DEPOSITS BY SENSING FLOW CHARACTERISTICS DURING BRIEF FLOW EXCURSIONS

William G. Characklis, 516 W. Cleveland St., Bozeman, Mont. 59715

Filed Sep. 30, 1982, Ser. No. 429,254
Int. Cl.³ G01N *11/04;* G01B *13/10*
U.S. Cl. 364—563 **3 Claims**



1. The method of determining the thickness of a fouling deposit in a hydraulic conduit of uniform cross section which comprises the steps of:
determining, for a test section of said conduit, while in a clean and polished condition, the relationship between fluid flow velocity and fluid pressure drop over a wide range of fluid flow velocities;
recording said relationship to establish, for later use, a reference characteristic;
using said conduit for a period of time during which the conduit becomes coated with a fouling deposit;
at the end of said period of time determining, for said test section, while in its then fouled condition, the relationship between fluid flow velocity and fluid pressure drop over a wide range of fluid flow velocities;
recording said relationship to establish, for the time of the test, a transitory test characteristic;
comparing said reference characteristic with said transitory test characteristic to determine the critical fluid velocity below which the two characteristics are substantially identical and above which they diverge; and
utilizing said critical fluid velocity as a measurement to determine the thickness of the fouling deposit in said conduit at said time of the test.

4,521,865

PROGRAMMABLE FUNCTION GENERATOR

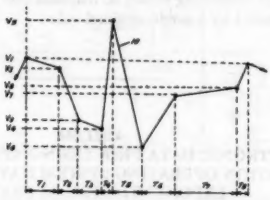
Dean M. Winkler, 21 W. 86 St. 501, New York, N.Y. 10024; Jeffrey B. Curtis, 11434 Stewart La., Silver Spring, Md. 20904, and Aaron J. Heller, 367 Congress St., Troy, N.Y. 12180

Filed May 28, 1982, Ser. No. 383,147
Int. Cl.³ G06J *1/00*
U.S. Cl. 364—608 **27 Claims**

1. Apparatus for generating a signal representative of a function or the like comprising a sequence of line segments, the apparatus comprising:
first programmable input means for defining a first parameter corresponding to each of said line segments;
second programmable input means for generating a reference voltage representative of a second parameter corresponding to each of said line segments;
means connected to said second programmable input means for storing said reference voltages;
means connected to said first programmable input means for generating control signals representative of each of said first parameters; and

means connected to said second programmable input means, said means for generating control signals, and said means for storing said reference voltages for generating an output signal comprising portions representative of each of said line segments, each of said portions being generated over a period determined by the control signal corresponding to the line segment which said portion represents and having an initial value determined by the stored reference voltage corresponding to the line segment previous to the line segment which said portion represents, and a final value determined by the reference voltage for the line segment which the portion represents, wherein said first programmable input means comprises:

a power source;



first variable resistance means corresponding to each of said line segments;

analog switch means having data input means for each of said line segments, data output means, and address signal input means, each of said first resistance means being connected between said source and a different one of said data input means, said data output means being connected to said means for generating said control signal; and

means for generating address signals, said address signal generating means being connected to said switch means address input means, and being effective to cause said switch means to select and connect one of said data input means to said data output means.

4,521,866

DISTRIBUTED ARITHMETIC OVERSAMPLING RECURSIVE DIGITAL FILTER

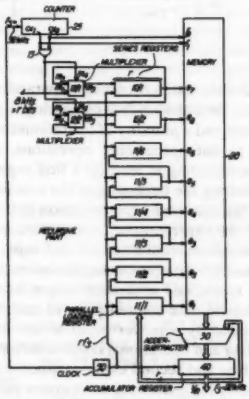
Jean-Pierre Petit, 16, rue Le Peletier, 22220 Treguier, and Xavier Maitre, Route de Pennker, Le Bourg, 22300 Lannion, both of France

Filed Aug. 17, 1981, Ser. No. 293,606

Claims priority, application France, Aug. 27, 1980, 80 18579

Int. Cl.³ G06F *15/31*

U.S. Cl. 364—724 **4 Claims**



1. A distributed arithmetic oversampling recursive digital filter, comprising:

(a) a recursive part of order q comprising a parallel loading register having an output terminal and an input terminal, and q−1 series registers each of r cells, r being an integer connected in cascade;

(b) a non-recursive part of order p comprising series registers each of r cells each series register having one input terminal receiving input signals, said input signals being blockable P times out of N, wherein P and N are integers;

(c) a modulo N counter with α output terminals;

(d) a memory divided into N memory blocks, each of said memory blocks containing a set of calculated quantities characterizing the filtering to be carried out, said memory having α addressing input terminals corresponding to said blocks, said addressing input terminals being connected to said α outputs of said modulo N counter and said addressing input terminals within a block being connected to the output terminals of said series registers of said recursive and said non-recursive parts and said memory having an output terminal;

(e) an adder-subtracter having an input terminal connected to the output terminal of said memory and having an output terminal;

(f) an accumulator register having an input terminal connected to said output terminal of said adder-subtracter and having an output terminal connected to said input terminal of said parallel loading register and to said input terminal of said adder-subtracter;

(g) a clock having a first output terminal connected to said parallel loading register and said series registers, said first output terminal delivering a clock signal at a frequency rf_s, and a second output terminal connected to said modulo N counter, said second output terminal delivering a clock signal at a frequency f_s, said filter having an input terminal for receiving samples at a sampling frequency f_E, said frequency f_s of said clock being equal to Nf_E, said non-recursive part comprising at most K+1 series registers, K being an integer defined by the relationship $(K-1)N+2^{\alpha}-N \leqq p+P-1<KN+2^{\alpha}-N$, and wherein said filter further comprises a first plurality of first through Kth multiplexers each having first and second input terminals, a control input terminal and an output terminal, said output terminal of each said multiplexer being operatively connected to either said first or second input terminals according to a signal supplied to said control input signal, said second input terminal of each of said multiplexers being connected to the output terminal of an associated one of said series registers, said first input terminal of the jth multiplexer, j being an integer, $1<j \leqq K$, being connected to the output terminal of that one of said series registers associated with the (j−1)-th multiplexer said first input terminal of said first multiplexer being connected to said input of said filter, and said control input terminal of said j-th multiplexer being controlled by said modulo N counter in such a way that when the content of said modulo N counter is at a maximum, said output terminal of said j-th multiplexer is operatively connected to said first input terminal of said j-th multiplexer, thereby making said series registers circulating, and when the content of said modulo N counter differs from its maximum output, said output terminal of said j-th multiplexer, is operatively connected to said second input terminal.

4,521,867

IIR DIGITAL FILTER HAVING LOW COEFFICIENT SENSITIVITY

Masao Kasuga, Sagamihara, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Aug. 23, 1982, Ser. No. 410,710

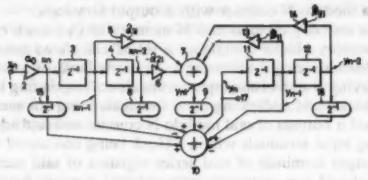
Claims priority, application Japan, Aug. 24, 1981, 56-132306

Int. Cl.³ G06F *7/38*; H03H *7/28*

U.S. Cl. 364—724 **8 Claims**

1. An Infinite Impulse Response digital filter comprising: a plurality of first feedforward circuits for successively delaying and scaling input discrete samples x_n by selected values of filter

coefficient, a plurality of first feedback circuits for successively delaying and scaling output discrete samples y_n by selected filter coefficient values, first combining means arranged to receive discrete samples from said first feedforward and feedback circuits to provide a first signal representative of a decimal fractional part of the filter coefficient, a plurality of second feedforward circuits for successively delaying and shifting said



input discrete samples x_n by selected values, a plurality of second feedback circuits for successively delaying and shifting said output discrete samples y_n by selected values, second combining means arranged to receive discrete samples from said second feedforward and feedback circuits to provide a second signal representative of an integer part of the filter coefficient, said first and second signals being combined in the second combining means to provide the output samples y_n, and bit shifting means provided for shifting discrete samples which appear in any one of circuits to said feedforward, feedback and combining means so that said first signal is shifted by a predetermined value.

2. An Infinite Impulse Response digital filter for filtering a digital input signal representative of a sequence of discrete samples x_n to generate a sequence of discrete output samples y_n according to a transfer function represented by

$$\sum_{K=0}^{N} b_K \cdot y_{(n-K)} = \sum_{K=0}^{M} a_K \cdot x_{(n-K)}$$

where, a_K and b_K are weighting factors given by

$$a_K = A_K \pm \alpha_{Ki} 2^{-i}$$

$$b_K = B_K \pm \beta_{Ki} 2^{-j}$$

where, A_K and B_K are integers, $\alpha_{Ki} 2^{-i}$ and $\beta_{Ki} 2^{-j}$ are fractions, α_{Ki} and β_{Ki} are weighting factors, and i, j are constants, whereby said transfer function is rewritten as

$$\sum_{K=0}^{N} B_K \cdot y_{(n-K)} = \sum_{K=0}^{M} A_K \cdot x_{(n-K)} \pm 2^{-i}\left(\sum_{K=0}^{M} \alpha_{Ki} \cdot x_{(n-K)} \pm \sum_{K=0}^{N} \beta_{Ki} \cdot 2^{i-j} \cdot y_{(n-K)} \right)$$

said digital filter comprising:

first feedforward means for successively delaying and scaling said input signal by selected values α_{Ki} to provide a plurality of first feedforward signals;

first combining means for providing a first combined signal representing

$$2^{-i}\left(\sum_{K=0}^{M} \alpha_{Ki} \cdot x_{(n-K)} \pm \sum_{K=0}^{N} \beta_{Ki} \cdot 2^{i-j} \cdot y_{(n-K)} \right)$$

in response to the combining of said first feedforward signals and a plurality of first feedback signals;

second feedforward means for successively delaying and shifting said input signal x_n by selected values to provide a plurality of second feedforward signals;

second combining means for providing a second combined signal representing

$$\sum_{K=0}^{N} B_K \cdot y_{(n-K)} \pm \sum_{K=0}^{M} A_K \cdot x_{(n-K)}$$

in response to the combining of said second feedforward signals and a plurality of second feedback signals and providing said output signal y_n in response to the combining of said first and second combined signals;

first feedback means coupled to said first combining means for successively delaying and scaling said first combined signal by selected values β_{Ki} to provide said first feedback signals;

second feedback means coupled to said second combining means for successively delaying and shifting said second combined signal by selected values to provide said second feedback signals; and

bit shifting means arranged to shift discrete samples which occur in any one of circuits to said feedforward, feedback and combining means so that said first combined signal is shifted by a predetermined value.

4,521,868

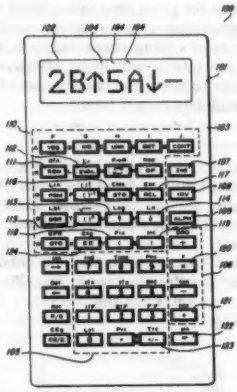
ELECTRONIC DATA PROCESSING APPARATUS WITH EQUATION OPERATING SYSTEM HAVING IMPROVED EXPONENTIATION OPERATORS

David Caldwell; Linda J. Ferrio, and Arthur C. Hunter, all of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 381,985, May 25, 1982,. This application Feb. 29, 1984, Ser. No. 584,841

Int. Cl.³ G06F 7/552

U.S. Cl. 364—753 **11 Claims**



1. An electronic data processing apparatus comprising:

an input means for entering data processing functions including numeric data and a plurality of operational commands corresponding to data processing operations, said operational commands including at least (a) a first exponentiation command indicating the beginning of the expression of an exponent and (b) a second exponentiation command indicating the end of the expression of an exponent;

an arithmetic means connected to said input means for performing entered data processing functions and generating a numerical result, said arithmetic means including means for raising numeric data entered prior to each first exponentiation command by a power equal to the evaluation of the numeric data and operational commands between the corresponding first and second exponentiation commands; and

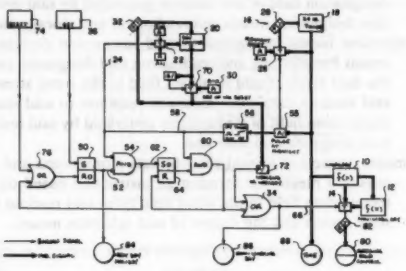
an output means for generating an operator perceivable indication of said numerical result generated by said arithmetic means.

4,521,869

PROGRAM TIMER CONTROL

William H. Moss, Willoughby, and Thomas J. Scheib, Chesterland, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 2, 1982, Ser. No. 364,822
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—900 **6 Claims**



1. A program timer control for controlling the variation of a parameter in an operating system comprising:

a real time integrator for generating a time signal corresponding to the time of day during at least one twenty four hour period;

pulse means connected to said integrator for generating a day pulse upon the passage of each full day;

a controllable parameter controller for varying the parameter of the operating system;

a first function generator for controlling the parameter controller according to a first function corresponding to a working day;

a second function generator for controlling the parameter controller according to a second function corresponding to a non-working day;

a controllable selection switch connected to said function generators and said parameter controller for applying one of said first and second functions to said parameter controller;

a day counter connected to said pulse means for counting the passage of days and for generating a weekend signal upon the occurrence of a weekend day;

a manually operable setting means operable when a following day is a holiday to generate a holiday occurrence signal; and

a logic circuit connected to said setting means, said day counter, said pulse means and said selection switch for operating said selection switch to apply said second function corresponding to a non-working day to said parameter controller upon one of the occurrences of a weekend signal and a day pulse signal which occurs immediately after said logic curcuit has received a holiday occurrence signal, said logic circuit controlling said switch to apply said first function corresponding to a working day to said parameter controller at all other times.

4,521,870

AUDIO/VIDEO SYSTEM HAVING TOUCH RESPONSIVE FUNCTION DISPLAY SCREEN

John H. Babbel, Mountain View; William A. Russell, Atherton, and Robert B. Steele, Fremont, all of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 509,097, Jun. 28, 1983, abandoned, which is a continuation of Ser. No. 252,571, Apr. 9, 1981, abandoned. This application Oct. 18, 1984, Ser. No. 662,529
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **12 Claims**

1. An audio/video editing system comprising:

at least one source recorder device for supplying a source of audio/video information;

a recording recorder device for recording selected audio/video information from the at least one source recorder device;

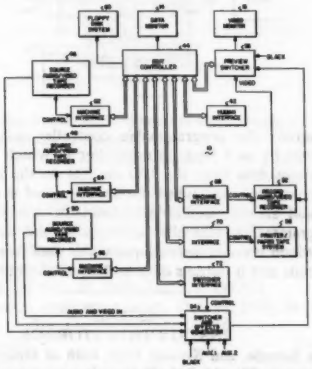
a switcher device for selectively coupling the at least one source recorder device and the recording recorder device;

computer means for providing selected edit commands;

an operator controlled input device including edit function display/indicating means for supplying serial edit function messages indicative of selected editing functions to be performed by the recorder device and the switcher device;

an operator intelligent line controller coupled to the operator controlled input device for identifying, converting and buffering the serial edit function messages in response to the computer means edit commands to provide corresponding parallel edit commands;

a plurality of device intelligent line controllers coupled to the operator intelligent line controller for establishing



communication with the respective recorder and switcher devices, and for converting and buffering the parallel edit commands to define serial edit commands, in response to the computer means;

a plurality of interfaces coupled between respective device intelligent line controllers and respective recorder devices and switcher device for translating the serial edit commands to a form commensurate with the requirements of the respective devices, and for translating device edit status messages from the respective devices for return to respective device intelligent line controllers, in response to the computer means; and

said device line controllers further converting and buffering the returned device edit status messages in response to the computer means.

4,521,871

PROGRAMMABLE CONTROLLER WITH BACK-UP CAPABILITY

Daniel J. Galdun, Huntsburg, Ohio; Raymond A. Grudowski, Round Rock, Tex., and Mark A. Flood, Richmond Heights, Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

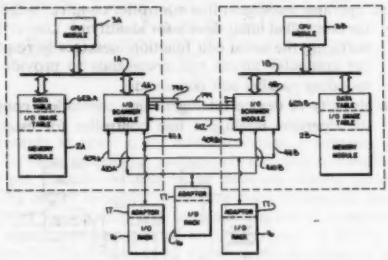
Filed Apr. 12, 1982, Ser. No. 367,594
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—900 **6 Claims**

1. In a programmable controller having a memory which stores a control program and a data table, and having a processor for executing the control program to input status data from I/O circuits which connect to a machine being controlled and for outputting data to the I/O circuits for operating devices on the machine being controlled, the improvement comprising:

mode indicating means for indicating that the programmable controller is either in an active or a back-up mode of operation;

means coupled to the mode indicating means and being operable when the programmable controller is in the back-up mode for inhibiting the output of data to the I/O circuits;

means for coupling the programmable controller to another similar programmable controller which is connected to the same I/O circuits and being operable when a switch signal is received from the said another similar programmable controller for operating said mode indicating means to indicate that the programmable controller is in the active mode;



whereby the programmable controller may be operated initially as a back-up controller in which it only inputs status data from the I/O circuits on the machine being controlled, and when the switch signal is received from said another similar programmable controller, the programmable controller changes to the active mode in which it continues to input status data from the I/O circuits and it outputs data to the I/O circuits.

4,521,872

INSTRUCTION STORAGE

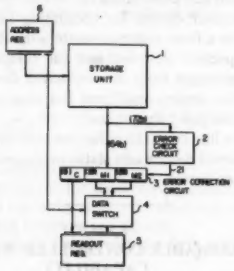
Hideo Sawada, and Kiyoshi Yata, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,118

Claims priority, application Japan, Dec. 10, 1980, 55-173282

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—49 **11 Claims**



1. An instruction storage for a data processing system comprising

storage means for storing a plurality of words, each word in said storage means including a plurality of multi-field instructions and having a first data field including a plurality of data areas, each said data area including those fields of a respective one of said plurality of multi-field instructions which are not identical in all of said instructions, and a second data field including a single data area for fields of the plurality of instructions which are identical in all of said plurality of multi-field instructions;

instruction designation means connected to said storage means for designating one of said words to be read from said storage means by generation of an address including a first designation field for designating a word in said storage means and a second designation field for designating one of the data areas of the first data field of said word, including means for applying said first designation field of said address to said storage means to read out said designated word;

readout data store means connected to said storage means for temporarily storing the word designated by said first designation field of said address generated by said instruction designation means and read out of said storage means;

selection means connected to said instruction designation means for selecting and reading out said designated one of the data areas of said first data field in the word stored in said readout data store means in response to said second designation field of said address generated by said instruction designation means; and

means connected to said readout data store means and said selection means for forming an instruction based on the second data field in the word read from said readout data store means and the output of said selection means.

4,521,873

METHOD OF AND CIRCUIT ARRANGEMENT FOR READING AN INTEGRATED SEMICONDUCTOR STORE WITH STORAGE CELLS IN MTL (I^2L) TECHNOLOGY

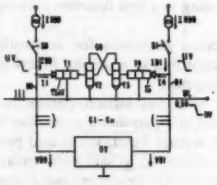
Klaus Heuber, Böblingen, and Siegfried K. Wiedmann, Stuttgart, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,122

Claims priority, application European Pat. Off., Oct. 30, 1981, 81 109 368.1

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—190 **2 Claims**



2. A method of reading an I^2L memory cell where said cell is in either a first stable state or a second stable state, said cell, prior to being read, being maintained in either said first stable state or said second stable state by being provided with electrical energy having a fixed magnitude, said cell being connected between a pair of bit lines and a word line in a solid state memory, said method comprising the following steps in the order recited:

(1) utilizing said pair of bit lines and said word line to increase the magnitude of the electrical energy provided to said cell for a first predetermined period of time, said first predetermined time period having a time of origin and a time of termination;

(2) utilizing said pair of bit lines and responsive to said increase in the magnitude of the electrical energy provided to said cell, sense the electrical energy stored by said cell to determine whether said cell is in said first stable state or in said second stable state; and, said method being characterized by the afore recited step (1) including, in the order recited, the following substeps,

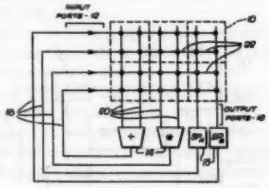
(1a) lowering the potential impressed on said word line for said first predetermined time period, and

(1b) impressing an increased current on each of said bit lines for a second predetermined time period, said second predetermined time period being shorter in duration that said first predetermined time period and said second predetermined time period wholly occurring within said first predetermined time period.

4,521,874
RANDOM ACCESS MEMORY DEVICE

Bantwal R. Rau, Los Gatos; Christopher D. Glaeser, Fremont, and Philip J. Kuekes, Berkeley, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sep. 28, 1982, Ser. No. 425,797
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—221 19 Claims



11. A random access storage and retrieval circuit, comprising:

a plurality of storage elements arranged in a logical sequence of contiguous locations numbered from 0 through n;

a write control line, to enable a writing operation into said circuit;

a set of write address lines, to define the location WA into which data is to be written;

an insert control line to allow optional insertion of written data into the logical sequence of contiguous locations;

a read control line, to enable a reading operation from said circuit;

a set of read address lines, to define the location RA from which data is to be read;

a purge control line, to allow optional purging of data read from said circuit;

data reading means responsive to signals on said read control line and said read address lines, for reading data from the read location RA specified by said read address lines;

data purging means, coupled to said data reading means and reponsive to signals on said purge control line, for purging data from the specified read location RA, and consolidating the remaining data into a single region of contiguous locations, by shifting down by one location all data stored in and above locations WA+1;

data writing means responsive to signals on said write control line and said write address lines, for writing new data into the write location WA specified by said write address lines; and

data insertion means, coupled to said data writing means and responsive to signals on said insert control line, for preserving previously stored data by first shifting up by one location the data stored in and above location WA.

4,521,875
ORIENTATION DETECTION SYSTEM FOR THIN-LINE TOWED SONAR ARRAYS

William A. Harrington, Whittier, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

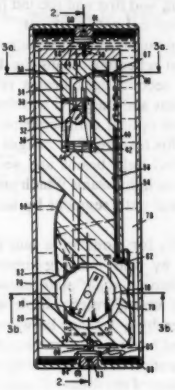
Filed Dec. 21, 1981, Ser. No. 332,999
Int. Cl.³ G01S *3/80*; G01C *17/26*
U.S. Cl. 367—130 41 Claims

20. A heating sensor for towed sonar arrays for providing electrical signals corresponding to the heading of the array comprising:

first means for providing a pulsating beam of light energy;

second means responsive to a magnetic field for changing the direction of the light beam, said second means including a magnetic wheel having a plurality of reflective facets about its perimeter; and

third means for measuring the change in direction of the light beam and providing electrical signals corresponding to the orientation of the system within the magnetic field, said third means including an array of photodetectors and electronic circuit means for ascertaining the pattern of

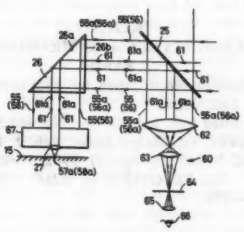


illumination on said photodetectors and providing a corresponding electrical output.

4,521,876
FOCUSING STATE MONITORING APPARATUS IN OPTICAL RECORDING APPARATUS

Ichiro Ueno, Isehara, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Oct. 16, 1980, Ser. No. 197,581
Claims priority, application Japan, Oct. 18, 1979, 54-134844
Int. Cl.³ G11B *7/12, 27/36*
U.S. Cl. 369—54 3 Claims



1. A monitoring apparatus for an optical recording system, said optical recording system including means for producing a first light beam and a second light beam, means for modulating said first and second light beams by a first signal and a second signal, said first and second light beams advancing in optical paths having an approximately common optical path segment, said advance being toward a recording medium, masking means positioned in said common optical path segment for eliminating portions of said first and second light beams incident thereupon in order to produce remaining portions of said first and second light beams, said remaining portions having diameters which are smaller than the respective diameters of the first and second light beams at said masking means, and focusing means in the common optical path segment for focusing said remaining portions of the first and second light beams from said masking means to form a first beam spot and a second beam spot on the recording medium, said first and second light beams being reflected at said first and second beam spots and going back into the common optical path segment as third and fourth light beams,

said monitoring apparatus comprising:

first reflecting means having at least a part in the common optical path segment before the focusing means for partially reflecting said first and second light beams back into the common optical path segment;

second reflecting means in the common optical path segment before the first reflecting means for directing the parts of the first and second light beams reflected by the first reflecting means and the third and fourth light beams out of the common optical path segment;

imaging means for forming first images of said parts of said first and second light beams and second images of said third and fourth light beams which are directed out of the common optical path segment by said second reflecting means; and

monitoring means for monitoring said first and second images formed by said imaging means, said monitoring means comprising a scale plate on which said first and second images are separately visible within the same field of vision, whereby a distance between the centers of said first and second beam spots is measurable through a corresponding separation of said first images on said scale plate and the accuracy of the focus of said first and second light beams can be monitored through said second images on said scale plate,

said first reflecting means having a flat reflective surface for reflecting the first and second light beams toward said second reflecting means.

4,521,877

REPRODUCING STYLUS AND METHOD OF MAKING SAME

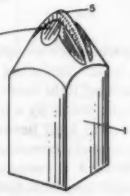
Hiroshi Shimamoto, Niiza, Japan, assignor to Namiki Precision Jewel Co., Ltd., Japan

Filed Feb. 2, 1983, Ser. No. 463,313

Claims priority, application Japan, Feb. 2, 1982, 57-015283; Mar. 23, 1982, 57-047539; Apr. 21, 1982, 57-056814[U]

Int. Cl.³ G11B *3/44;* B24B *1/00*

U.S. Cl. 369—173 **28 Claims**



1. A reproducing stylus for a record having a sound groove, said stylus formed by removing to a predetermined depth front and back portions of its contact area with the sound groove, said front and back portions being relative to the direction of stylus movement in the sound groove to obtain a groove contacting, ridge-like edge line portions having a lengthwise orientation perpendicular to the direction of record travel and a width d in said direction of record travel where the effective radius of curvature in said direction of record travel where the effective radius of curvature in said direction of record travel of the stylus tip is approximately ½ d.

4,521,878

DATA TRANSMITTING-RECEIVING SYSTEM

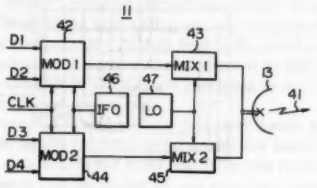
Noriyasu Toyonaga, Otawara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 28, 1983, Ser. No. 462,113

Claims priority, application Japan, Jan. 28, 1982, 57-12024; Dec. 9, 1982, 57-214657

Int. Cl.³ H04J *11/00*

U.S. Cl. 370—19 **11 Claims**



1. A data transmitting-receiving system comprising a transmitter unit, for transmitting two channels of data derived from a first route and two channels of data derived from a second route, and a receiver unit, for receiving, via a radio transmission line, said data, said transmitter unit comprising a transmitting apparatus generating a carrier from which is produced both a vertically (V) polarized wave and a horizontally (H) polarized wave each having the same frequency and in synchronism with each other and said V- and H-polarized waves being produced respectively according to said data from the first and second routes, the transmitting apparatus outputting a vector addition wave defined by both the modulated V- and H-polarized waves, and said receiver unit comprising a receiving apparatus receiving and dividing said vector addition wave into received V- and H-polarized waves, demodulating the V- and H-polarized waves, suppressing interference between the demodulated V- and H-polarized waves, between channels within each demodulated polarized wave and within data into a channel, and reproducing the original data of said first and second routes.

4,521,879

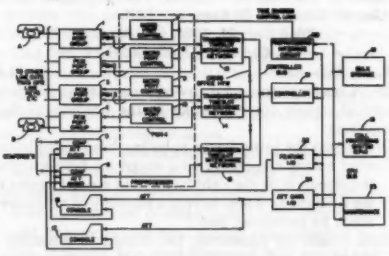
DIGITAL PRIVATE BRANCH EXCHANGE

Klaus Gueldenpfennig, 31 Lazy Trail, Penfield, N.Y. 14526; Stanley L. Russell, 649 Beverly Dr., West Webster, N.Y. 14580; William A. Oswald, 196 Fairhaven, Rochester, N.Y. 14610; Charles J. Breidenstein, 116A Clintwood Ct., Rochester, N.Y. 14620, and Karam V. Narula, 80 Fairhill Dr., Rochester, N.Y. 14610

Continuation of Ser. No. 003,070, Jan. 12, 1979, abandoned, which is a continuation of Ser. No. 855,181, Nov. 25, 1977, abandoned. This application Aug. 4, 1981, Ser. No. 289,960

Int. Cl.³ H04M *3/56;* H04Q *3/54, 11/04*

U.S. Cl. 370—62 **46 Claims**



1. An automatic private branch exchange comprising

a plurality of ports including line circuits and trunk circuits, said ports being divided into a plurality of distinct groups;

first stored program control means including a single individual microprocessor unit dedicated to each port for performing all real-time control in connection with the ports of the respective groups;

a common transmission network for all of said port groups including a plurality of inputs and a plurality of outputs and switching means for selectively interconnecting an input to an output;

each port group including information transmission means for connecting the ports to the inputs and outputs of said transmission network; and

second stored program control means including a central processing unit responsive to supervisory information from said first stored program control means for controlling said switching means to interconnect designated ports for establishing a communication path therebetween;

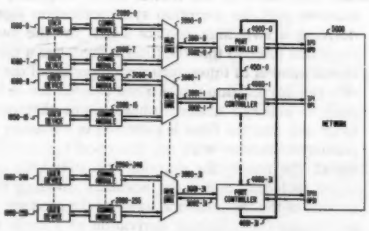
said first stored program control means further including, in each port group, strobe signal generating means responsive to the associated microprocessor unit for generating strobe signals for respective pairs of ports in the port group and port interface means connected to said microprocessor unit for applying said strobe signals to said pairs of ports sequentially in a repetitive cycle to sample the status of said ports.

4,521,880

TIME-SLOT INTERCHANGER FOR FAST CIRCUIT SWITCHING

Milo Orsic, Lincolnwood, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 6, 1983, Ser. No. 558,504
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—68 **23 Claims**



1. An arrangement comprising

a plurality of input storage locations for storing digital words,

a plurality of output storage locations for storing digital words.

control memory input path means for sequentially receiving connection words each defining one of said input storage locations and one of said output storage locations,

control memory means for storing, for at most a predetermined duration, each of said connection words received by said control memory input path means,

transfer means coupled to said control memory means and responsive to said connection words stored by said control memory means, for transferring digital words stored in ones of said input storage locations, to ones of said output storage locations as defined by those connection words and

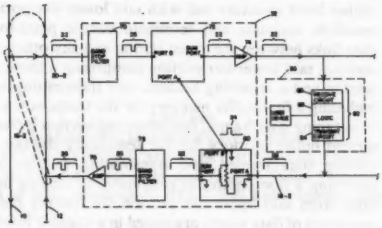
first enable gate means also coupled to said control memory means, for selectively transmitting ones of said connection words stored by said control memory means, to said control memory input path means for storage again by said control memory means.

4,521,881

DATA COMMUNICATION SYSTEM WITH INCREASED EFFECTIVE BANDWIDTH

Gary N. Stapleford, Londonderry, and Andrew J. Borsa, Pelham, both of N.H., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Nov. 2, 1981, Ser. No. 317,292
Int. Cl.³ H04J *1/10*
U.S. Cl. 370—72 **3 Claims**



1. A communication system with a network for interconnecting a plurality of user devices having means for transmitting signals to and receiving signals from said communications system, said communication system having means for providing a plurality of frequency multiplexed communication channels operating on different frequency bands for concurrent communication between said user devices,

wherein one or more but not all of said channels are dedicated as local service channels employing designated local frequencies,

said communication system including frequency selective isolation means connected into said network intermediately between user devices, thereby subdividing said network into a plurality of local subnets, each local subnet interconnecting a plurality of said user devices,

said frequency selective isolation means including means for blocking only the frequencies used by said local service channels from being transmitted from any of said local subnets to another while enabling transmission of frequencies other than those used by said local service channels between user devices connected on different subnets to isolate said subnets from one another as to the local service channels only,

said communication system providing communications on a particular one of said local frequencies between two of said user devices both connected on a first of said subnets while concurrently and without interference providing communications on the same particular local frequency between two of said user devices both connected on a second of said subnets, while concurrently and without interference providing communications on a frequency other than local frequencies between user devices connected on different subnets.

4,521,882

INTERFACE FOR ACCESSING A WIDE-BAND BUS HANDLING SPEECH AND DATA TRAFFIC

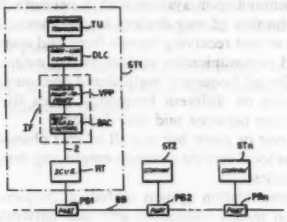
Luciano Gabrielli, Leini, and Maurizio Sposini, Turin, both of Italy, assignors to Cselt Centro Studi E Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Mar. 17, 1983, Ser. No. 476,224
Claims priority, application Italy, Mar. 17, 1982, 67340 A/82
Int. Cl.³ H04J *3/02*
U.S. Cl. 370—85 **13 Claims**

1. In a telecommunication system with a plurality of stations served by a common transmission channel for the selective exchange of digitized messages subsequently inserted by component BAC, into account.

the improvement wherein said processing means of a given station comprises an interface with a lower-tier portion

and an upper-tier portion in hierarchical relationship interposed between said transceiver means and a higher-level structure controlling the organization of outgoing messages into data frames headed by destination codes as well as the forwarding to a user of incoming messages destinged for the given station; said lower-tier portion including wired-logic circuit for controlling said transceiver means and temporarily storing outgoing and incoming messages, said upper-tier portion including microprogrammed circuitry for exchanging information with said higher-level structure and with said lower-tier portion to establish, maintain and terminate virtual point-to-point data links between the given station and any other of said stations, said lower-tier portion comprising a transmitting section and a receiving section, said transmitting section including a first buffer memory for the temporary storage of outgoing data frames, said receiving section including a second buffer memory for the temporary storage of incoming data frames; said transmitting section further including a first controller responsive to writing instructions from said upper-tier portion for loading outgoing sequences of data words organized in a variable number of



frames into said first buffer memory and, in response to an end-of-message signal from said upper-tier portion, transferring the contents of said first buffer memory to said transceiver means for delivery to said channel during an idle period thereof; said receiving section further including a second controller responsive to the arrival of an incoming sequence of data words, addressed to the given station, for writing same in said second buffer memory and, upon completed reception of the incoming sequence, transferring same from said second buffer memory to said upper-tier portion in response to a reading instruction therefrom, said first controller being provided with first load-limiting means responsive to exhaustion of the storage capacity of said first buffer memory for signaling said upper-tier portion to block the writing of additional data words in said first buffer memory and initiating a readout of the contents thereof to said transceiver means; said second controller being provided with second load-limiting means responsive to exhaustion of the storage capacity of said second buffer memory for signaling said upper-tier portion to block the writing of additional data words therein prior to a readout of the contents of said second buffer memory to said upper-tier portion.

4,521,883

TELEPHONY APPARATUS HAVING FILTER CAPACITOR SWITCHED TO UNDERGO DISCRETE PHASE JUMPS

Bernard Roché, 13, rue de Bourgogne, Lannion, France 92140

Filed Jun. 21, 1982, Ser. No. 390,789

Claims priority, application France, Jun. 22, 1981, 81 12251

Int. Cl.³ H04J *3/06*

U.S. Cl. 370—100 **8 Claims**

1. A system for transmitting and receiving telephony audio signals comprising:

a transmitter, the transmitter including:

means responsive to a telephony audio signal to be transmitted for deriving a digital information signal,

a master clock source having a frequency F_{MC},

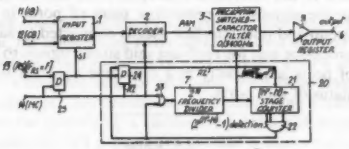
means responsive to the master clock source for deriving a time slot defining signal having a frequency $F_{TS}=F_{MC}\div 2^{N'}$, where N' is an integer greater than 2, and for deriving a transmit control signal having a frequency $F_{WT}=F_{MC}\div 2^{N}$, where N is an integer greater than 1 and less than N', the frequencies F_{TS} and F_{WT} controlling the frequency at which the digital information is transmitted from the transmitter;

a receiver responsive to the digital information signal, the receiver including:

a switched capacitor filter,

means for deriving the master clock frequency F_{MC},

means for deriving a reception synchronization signal having a frequency F_{RS} that is much lower than and asynchronous with the master clock frequency but which has approximately the same frequency as the time slot defining frequency,



means responsive to the information signal and the master clock frequency at the receiver, as well as to the reception synchronization signal, for supplying a pulse amplitude modulated signal indicative of the information signal to which the receiver is responsive to the switched capacitor filter,

means responsive to the master clock frequency at the receiver and the reception synchronization signal for deriving a switching control signal for the switched capacitor filter so that the filter is switched a predetermined number of times during each period of the reception synchronization signal while causing the switching time to undergo discrete phase jumps that occur at times uch that the filter is switched in a manner that is plesiosynchronous with the reception synchronization signal, the means for deriving the switching control signal including means for normally dividing the frequency of the master clock signal at the receiver by 2^{N}, and means for inhibiting derivation of a cycle by the means for dividing in response to the means for dividing deriving $2^{N'-N}$ cycles.

4,521,884

METHOD AND APPARATUS FOR ERROR DATA FEEDBACK IN A DISKETTE DRIVE

Gary L. Dix, Rochester; Lloyd S. Heim, Oronoco, both of Minn.; Robert F. Herald, Longmont, and William P. Quinlan, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 8, 1982, Ser. No. 439,956

Int. Cl.³ G06F *11/00*

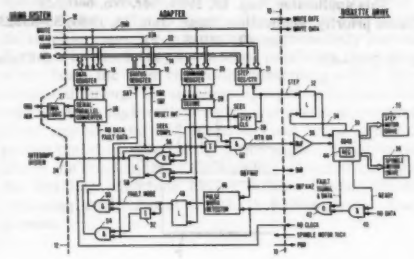
U.S. Cl. 371—15 **17 Claims**

1. Apparatus for transferring fault data from a recording device to a data processor connected to the device, said recording device having means responsive to the presence of first and second device-operation control signals on control lines from the processor to said device for controlling the operation of said device, and having a read output line for passing recorded data from said device to the processor, said transfer apparatus comprising:

storage means in said recording device for storing the fault data;

means in said recording device for generating a fault signal on the read output line;

means in said processor responsive to the fault signal on the read output line for inhibiting said first control signal from the processor to said device; and



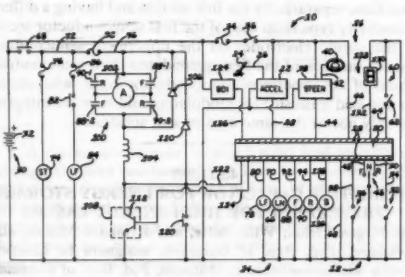
control means in said recording device responsive to the absence of the first control signal for interpreting the second control signal as a data gating signal for outputting the fault data from said storage means to the read output line in response to said gating signal so that the fault data is passed to said processor.

4,521,885

DIAGNOSTIC DISPLAY APPARATUS

Grant C. Melocik, Chardon, and William Pickering, University Heights, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jan. 5, 1983, Ser. No. 455,721
Int. Cl.³ G08B *21/00*; G06F *11/32*
U.S. Cl. 371—29 **9 Claims**



1. An electric vehicle diagnostic apparatus (10), comprising:

a battery (32);

transducer means (124) for producing a battery condition signal;

a plurality of manually operable command signal producing devices (12), each adapted to produce respective input command signals;

means (60) for producing first and second diagnostic command signals; and

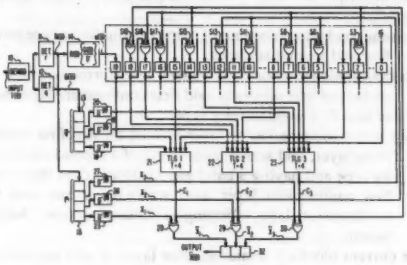
means (128) for receiving said plurality of input command signals, said battery condition signal, and said first and second diagnostic command signals, substantially continuously displaying a predetermined condition of said battery (32) in response to the condition of said battery (32) and to initially receiving a predetermined one of said first and second diagnostic command signals, displaying a predetermined diagnostic code in response to initially receiving the other of said first and second diagnostic command signals, and automatically incrementally sequencing said displayed code in response to receiving predetermined ones of said plurality of input command signals in a predetermined sequence or to cyclic operation of said diagnostic command signal producing means (60).

4,521,886

QUASI-SOFT DECISION DECODER FOR CONVOLUTIONAL SELF-ORTHOGONAL CODES

Peter M. Dollard, Highlands, and William Turin, Morganville, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 8, 1983, Ser. No. 511,852
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—43 **4 Claims**



1. A decoder for convolutional self-orthogonal codes comprising:

means responsive to an input convolutional self-orthogonal encoded signal including a plurality of serially transmitted m-bit groups, for detecting data and parity bits included in each m-bit group and then generating a first output signal representative of each of said data and parity bits and a second output signal associated with each detected data and parity bit which is a comparison of the input signal level of each bit and a predetermined signal threshold level;

means responsive to the first output signal from the detecting means for verifying the parity of the detected data and parity bits associated with each m-bit group in conjunction with bits in other m-bit groups and generating a syndrome bit output signal indicative of the success or failure of such verification;

a multistage syndrome shift register for storing the syndrome bit output signals from the verifying means at an m-bit transmission rate;

means responsive to each second output signal of the detecting means associated with a data bit of an m-bit group and an associated predetermined selection of stored syndrome bits from the syndrome register for generating an associated information correction bit output signal for use in selected correction of the associated stored signals in the syndrome register; and

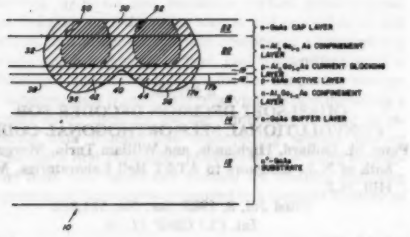
means responsive to each information correction bit and an associated data bit from the first signal from the detecting means for generating a decoder output signal indicative of the most probable estimate of the associated data bit.

4,521,887

W-SHAPED DIFFUSED STRIPE GAAS/ALGAAS LASER

Yet-Zen Liu, Westlake Village; Chi-Shain Hong, Newbury Park, and P. Danial Dapkus, Anaheim, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 7, 1982, Ser. No. 415,639
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 11 Claims



1. A stripe-geometry semiconductor laser device comprising:

a semiconductor substrate of a first conductivity type having first and second surfaces;

a first semiconductor confinement layer formed on said first surface of said substrate, said first confinement layer being of said first conductivity type;

an active semiconductor layer formed on said first confinement layer, said active layer being of a second conductivity type and having a band gap narrower than that of said first confinement layer, said active layer and said first confinement layer forming a heterojunction therebetween;

a current blocking semiconductor layer of said second conductivity type formed on said active layer, said current blocking layer having a band gap wider than that of said active layer, said current blocking layer and said active layer forming a heterojunction therebetween;

a second semiconductor confinement layer formed on said current blocking layer, said second confinement layer being of said first conductivity type and having a band gap wider than that of said active layer;

an elongated stripe region extending longitudinally between two reflective surfaces located on respective ends of said device, portions of said stripe region extending vertically from an upper surface of said second confinement layer through portions of said current blocking layer, said active layer, and said first confinement layer, said stripe region having a w-shaped cross-section taken in a vertical plane, a central portion of said stripe region vertically extending from said upper surface of said second confinement layer through portions of said current block layer, said stripe region defining two parallel longitudinally extending stripe active regions in said active layer, a portion of said active layer being located between said two longitudinally extending active stripe regions, said stripe region being doped with an impurity of said second conductivity type, said active stripe regions having an index of refraction different from the remaining portions of said active layer; and

electrode means coupled to said second surface of said substrate and to said upper surface of said second confinement layer;

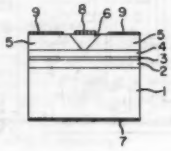
wherein laser oscillation takes place in said portion of said active layer located between said two longitudinally extending active stripe regions, the resultant laser radiation being guided by said portion of said active layer.

4,521,888

SEMICONDUCTOR DEVICE INTEGRATING A LASER AND A TRANSISTOR

Hideki Hayashi, and Kenichi Kikuchi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 275,029, Jun. 18, 1981, abandoned.
This application Aug. 13, 1984, Ser. No. 640,229
Claims priority, application Japan, Jun. 24, 1980, 55-85523
Int. Cl.³ H01S 3/19
U.S. Cl. 372—50 3 Claims



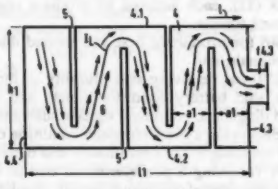
1. In a semiconductor device integrating a semiconductor laser and a transistor for modulating the laser, comprising semiconductor layers on a substrate and ohmic electrodes on the back surface of the substrate and on the uppermost semiconductor layer, the improvement wherein the semiconductor layers except the uppermost layer are semiconductor layers whose cavity is constructed by a pair of parallel cleavages or etched surfaces perpendicular to the semiconductor layers, the uppermost semiconductor layer is portioned into three semiconductor sections by a V-shaped boundary extending through the entire thickness of the uppermost semiconductor layer perpendicular to the cleavages or etched surfaces, the three semiconductor sections being a first semiconductor section within the V-shaped boundary and being of the same conductivity type as that of the semiconductor layer lying below said first semiconductor section, and second and third semiconductor sections separated by the first section and having a different conductivity type from that of the first semiconductor section, and the ohmic electrodes on the uppermost semiconductor layer are on each of the first, second and third semiconductor sections of the uppermost semiconductor layer, whereby said laser and said transistor for modulating said laser are integrated vertically above the same area of said substrate.

4,521,889

MICROSTRIP CAPACITOR FOR ENERGY STORAGE, PREFERABLY FOR HIGH-ENERGY LASERS

Hans-Jürgen Cirkel; Willi Bette, and Reinhard Müller, all of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,651
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128206
Int. Cl.³ H01S 00/00
U.S. Cl. 372—87 14 Claims



1. In a high-energy laser of the TE type having an optical axis, a laser chamber with at least two laser electrodes having a gas space therebetween, the laser electrodes being spaced

apart opposite each other and extending parallel to the optical axis, excitation produced by an arc-free capacitor discharge in the gas space being as homogeneous as possible, a pulse forming network connected to the laser electrodes, conductors of a stripline capacitor connected to the laser electrodes, contact-break electrodes connected to a fast high-voltage switch, the contact-break electrodes being connected to the laser electrodes, dielectric layers disposed between the conductors of the stripline capacitor in a direction substantially normal to a direction in which they are stacked parallel to the optical axis of the laser, the laser electrodes comprising a first electrode connected through the stripline capacitor to the pulse-forming network for a high voltage pulse, and a second electrode disposed opposite the first electrode and being connected to ground potential, wherein the improvement comprises: at least one of the conductors of the stripline capacitor connected to the first laser electrode having notches formed therein for increasing current path length therethrough for discharge current.

4,521,890
PLASMA ARC FURNACES

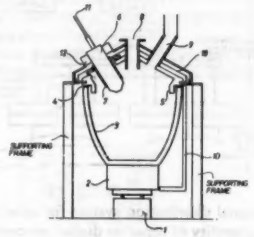
Robert F. Burnham, Reading; Alan Gibbon, Near Reading, and John E. Harry, Near Oakham, all of England, assignors to Johnson Matthey Public Limited Company, London, England

Filed May 25, 1983, Ser. No. 498,114

Claims priority, application United Kingdom, May 25, 1982, 8215192

Int. Cl.³ H05B *7/00*

U.S. Cl. 373—22 **3 Claims**



1. A plasma arc furnace in which solid feed material passes through the arcs produced by at least two stationary plasma torches positioned at or near the upper end of a furnace chamber and directed downwardly at an inclined angle towards an electrically conducting vessel for containing melt produced in the furnace and two or more electrical return anode connections made to said vessel at a level above the point of coalescence of the arcs produced, in use, by the said torches.

4,521,891
MULTIPLE CHANNEL DATA COMMUNICATION SYSTEM

Kenneth J. Biba, San Francisco, and Jose J. Picazo, Jr., San Jose, both of Calif., assignors to Sytek, Incorporated, Mountain View, Calif.

Division of Ser. No. 166,384, Jul. 7, 1980, Pat. No. 4,365,331. This application Feb. 26, 1982, Ser. No. 352,894

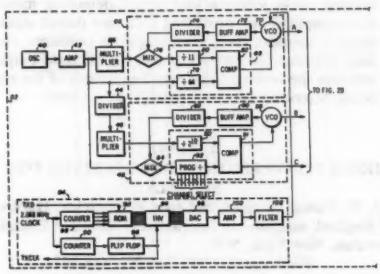
Int. Cl.³ H04B *1/38*

U.S. Cl. 375—8 **14 Claims**

1. A MODEM for data communication comprising in combination:

a main phase lock loop circuit electrically connected to a fixed frequency temperature compensated oscillator circuit and including a main frequency divider connected to the fixed frequency oscillator circuit for dividing a first output signal from the fixed frequency oscillator circuit by a first fixed factor and for providing a main fixed frequency output signal, a main mixer electrically connected to the fixed frequency oscillator circuit and a main feedback loop for modifying a reference signal frequency from the fixed frequency oscillator circuit, a programmable divider connected to said main mixer and a plurality of channel select lines connected to a support element, each of said plurality of channel select lines including a binary value for determining the divisor of the programmable divider, a main phase comparator joined to said main frequency divider and said programmable divider for comparing said main fixed frequency output signal of the main frequency divider and an output signal frequency of the programmable divider, said main feedback loop including a main voltage controlled oscillator electrically connected to said main mixer and said main phase comparator for providing a main voltage controlled oscillator output signal with a main oscillator output signal frequency controlled by an output voltage signal from said main phase comparator, said main phase comparator adjusting said output voltage signal from said main phase comparator until said main oscillator output signal frequency is fixed, wherein said main oscillator output signal frequency of said main voltage controlled oscillator is dependent upon said binary value of said channel select lines;

a transmitter for generating a frequency modulated signal including a transmit phase lock loop circuit comprising a first transmit frequency divider connected to said fixed frequency oscillator circuit for dividing a second output



signal from the fixed frequency oscillator circuit by a second fixed factor and providing a first transmit fixed frequency output signal, a transmit mixer electrically connected to the fixed frequency oscillator circuit and a transmit feedback loop within the transmit phase lock loop circuit for providing an output frequency signal of said transmit mixer equal to the difference between the frequency of a third output signal from the fixed frequency oscillator circuit and the frequency of an output signal of said transmit feedback loop, a second transmit frequency divider connected to said transmit mixer for dividing an output signal frequency of said transmit mixer by a third fixed factor and for providing a second transmit fixed frequency output signal, a transmit phase comparator connected to said first transmit frequency divider and to said second transmit frequency divider for comparing said first transmit fixed frequency output signal and said second transmit fixed frequency output signal, said transmit feedback loop including a transmit voltage controlled oscillator electrically connected to said transmit mixer and said transmit phase comparator to provide a transmit voltage controlled oscillator output signal with a transmit oscillator output signal frequency controlled by an output voltage signal from said transmit phase comparator and by an amplitude modulated signal from a data encoder, said transmit voltage controlled oscillator output signal being said frequency modulated signal and having a center frequency generated by the transmit phase lock loop

circuit, said main oscillator output signal frequency being differentially combined with said transmit oscillator output signal frequency within an output mixer electrically connected to said main voltage controlled oscillator and said transmit voltage controlled oscillator to provide a transmitter output signal to a coaxial transmission cable wherein and output frequency bandwidth of the transmitter is determined by said channel select lines; and

a receiver for providing a digital data output including a first receiver mixer connected to said main voltage controlled oscillator within the main phase lock loop circuit and the coaxial cable for differentially combining the frequencies of a frequency modulated receive signal with a main oscillator output signal frequency and for providing a first receiver mixer signal, a first filter connected to said first receiver mixer for filtering said first receiver mixer signal and for providing a filtered first receiver mixer signal, a second receiver mixer connected to said first filter and a receiver oscillator for differentially combining said filtered first receiver mixer signal and a receiver oscillator signal for providing a second receiver mixer signal, a second filter connected to said second receiver mixer for filtering said second receiver mixer signal, said filtered second receiver mixer signal being a frequency modulated signal, an intermediate frequency amplifier connected to said second filter for amplifying said filtered second receiver mixer signal and for providing an amplified amplitude-modulated second receiver mixer signal to a data decoder and to a signal detecting means for detecting a signal received by the translating means from said transmission cable wherein said signal detecting means is a mute amplifier for providing a carrier detect signal to a support element for preventing data collision, and said data decoder for providing said digital data output and wherein the receive frequency bandwidth of the receiver being determined by said channel select lines.

4,521,892

DIRECT CONVERSION RADIO RECEIVER FOR FM SIGNALS

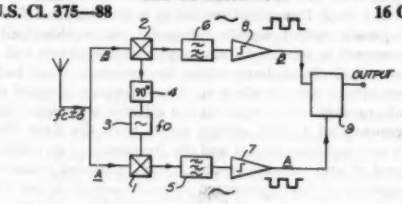
Ian A. W. Vance, Newport, and John K. Goatcher, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

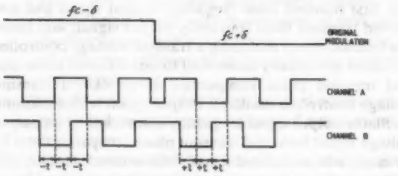
Filed Sep. 8, 1982, Ser. No. 415,782

Claims priority, application United Kingdom, Sep. 24, 1981, 8128956

Int. Cl.³ H03D *3/00*

U.S. Cl. 375—88 **16 Claims**





1. In or for a radio receiver for receiving frequency modulated signals with a varying frequency difference from a carrier frequency, and in which mixing with a local oscillator is used to produce quadrature baseband channels, a demodulator circuit comprising a first channel in which a first baseband signal at the difference frequency will appear, a second channel in which a second baseband signal at the difference frequency will appear in quadrature with respect to the first channel and lagging or leading the first baseband signal in dependence upon the received signal frequency being above or below the local oscillator frequency, respectively; and means for converting the outputs of said channels into an analog signal having an amplitude representative of the difference frequency.

4,521,893

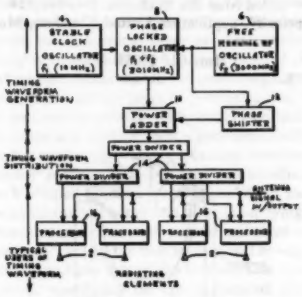
CLOCK DISTRIBUTION CIRCUIT FOR ACTIVE APERTURE ANTENNA ARRAY

Brian M. Bellman, Severna Park, Md., assignor to The Unites States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 21, 1983, Ser. No. 487,340

Int. Cl.³ H03B *21/01*

U.S. Cl. 375—107 **6 Claims**



1. A clock signal distribution system for synchronizing the operation of a plurality of separate digital processing elements having clock signal transmission paths of different lengths comprising:

a first oscillator providing a first output frequency f_1,

a second oscillator providing a second output frequency f_2,

a phase locked oscillator adapted to receive output frequency f_1 and output frequency f_2 from said first and second oscillators respectively to provide a single combined output frequency f_1+f_2,

a power adder having first and second inputs and an output,

means for coupling said single combined output frequency f_1+f_2 from said phase locked oscillator to said first input of said power adder, and

means for coupling said output frequency f_2 from said second oscillator to said second input of said power adder,

whereby a composite two-frequency clock signal is formed at the output of said power adder having sharply defined nulls occurring at the frequency f_1.

4,521,894

OVERSPEED/UNDERSPEED DETECTOR

Richard P. Moffat, Regina, Canada, assignor to Saskatchewan Power Corporation, Saskatchewan, Canada

Filed Apr. 22, 1982, Ser. No. 371,019

Int. Cl.³ G05B *11/06*; G05D *13/62*

U.S. Cl. 377—16 **12 Claims**

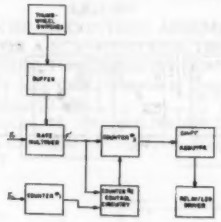
1. A device for detecting overspeed or underspeed condition in a rotating body, comprising:

(a) a source of a first train of electrical pulses whose pulse

repetition rate is proportional to the rotational speed of said rotating body;

(b) signal-generating means for producing a second pulse train whose pulse repetition rate is directly proportional to a predetermined overspeed or underspeed limit; and

(c) digital comparison means responsive to said first and second pulse trains adapted to compare the number of



pulses in said second pulse train occurring during an interval determined by a fixed number of pulses of said first puse train to a predetermined value independent of said predetermined overspeed or underspeed limit and to produce an output signal when said number of pulses of said second pulse train in said interval exceeds said predetermined value.

4,521,895

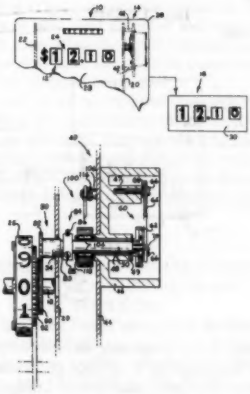
PULSE GENERATOR UNIT FOR FUEL PUMP REGISTER

Arthur J. Wells, Bloomfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Nov. 29, 1982, Ser. No. 445,049

Int. Cl.³ B67D *5/22;* **G01F** *15/06;* **G06M** *1/12*

U.S. Cl. 377—21 **16 Claims**



1. In a resettable fuel pump delivery register for registering the cost and volume of each fuel delivery and having a main frame with a pair of spaced generally parallel upright side frame members, at least one resettable counter with a bank of coaxial resettable counter wheels of increasing order mounted on a counter shaft with respective coaxial reset gears rotatable therewith, said counter shaft being axially shiftable to engage the reset gears with the counter to condition the counter for resetting, the counter being mounted on the main frame with the counter wheel bank mounted between the side frame members and with the counter shaft generally perpendicular to the side frame members for being read from one end of the register, and the lowest order counter wheel rotatable in a counting direction and an opposite resetting direction, the improvement wherein the resettable fuel pump delivery register further comprises a pulse generator unit comprising:

a mounting assembly mounted to the frame outwardly adjacent the lowest order counter wheel;

a pulser shaft rotatably received by said assembly;

an input gear means to rotatably couple said pulser shaft for rotation with said lowest order wheel;

a rotary permanent magnet mounted to said pulser shaft;

a ratchet clutch means to selectively restrict rotation of said pulser shaft to a counting direction or permit rotation of said pulser shaft in a resetting direction; and

a magnetic sensor operable by the rotary permanent magnet for generating a pulse train with a pulse for each predetermined increment of rotation of said magnet.

4,521,896

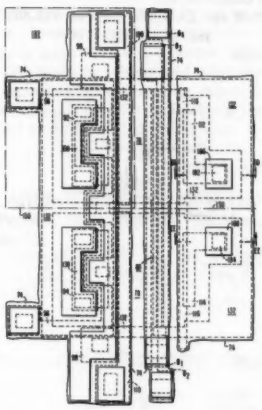
SIMULTANEOUS SAMPLING DUAL TRANSFER CHANNEL CHARGE COUPLED DEVICE

Gerald M. Borsuk, Washington, D.C.; Edwin E. Chesson, Odenton, Md.; Jerome C. Beard, Pasadena, Md., and Thomas K. Lisle, Jr., Baltimore, Md., assignors to Westinghouse Electric Co., Pittsburgh, Pa.

Filed May 14, 1982, Ser. No. 378,461

Int. Cl.³ G11C *19/28;* **H01L** *29/78, 29/04*

U.S. Cl. 377—60 **1 Claim**



1. A dual transport channel peristaltic charge coupled device (PCCD) for coherently processing two analog signals at simultaneous charge injection sampling frequencies of up to at least 60 MHz, said PCCD comprising:

a semiconductor substrate of a first conductivity type;

an upper layer of a second conductivity type disposed on the surface of said substrate;

an insulator layer disposed on said upper layer;

dual peristaltic N-stage in-line transport channels having parallel charge transport paths, respectively corresponding stages of the transport channels including a common insulatedly separted multi-gate structure disposed over said insulator layer, said multi-gate structures arranged cascadedly along the length of the charge transport path respectively over each in-line stage thereof; and

dual partition mode input charge injection stages corresponding to said dual transport channels, each injection stage including:

an input charge injection region of a second conductivity type disposed in the surface of said upper layer at one end of its corresponding transport channel, said injection region being of a higher conductivity than said upper layer, both injection stages including:

a charge sampling gate region of polysilicon material,

common to both charge injection regions, disposed within said insulator layer and extending across the width of both transport channels between said charge injection regions and corresponding charge transport channels with portions thereof in juxtaposition with said charge injection regions; and

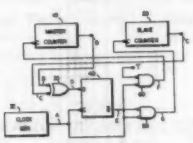
a charge sampling gate metallic contact layer disposed on said insulator layer over said charge sampling gate region across the width of both transport channels and making contact with said polysilicon sampling gate region through a multiplicity of window sections removed from said insulator layer, said contact windows being distributed across the width of said polysilicon sampling gate region to sectionalize the distributed parameter impedance thereof to reduce the signal propagation time across said width, thereby improving both the frequency and time matching of simultaneous input charge injection sampling of said dual charge injection stages to the extent necessary for simultaneous charge injection frequencies of up to at least 60 MHz.

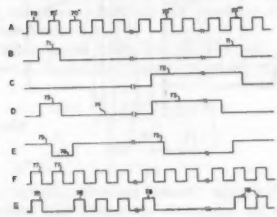
4,521,897

APPARATUS FOR SYNCHRONIZING THE OPERATION OF MASTER AND SLAVE COUNTERS

Richard G. Merrell, Hebron, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 29, 1983, Ser. No. 518,509
Int. Cl.³ H03L *7/00*
U.S. Cl. 377—115 **7 Claims**





1. Apparatus for synchronizing the operation of a master and a slave counter comprising:

means for generating a clock signal;

logic means developing a control signal representing the exclusive OR/NOR combination of the outputs of said counters;

bi-stable means responsive to said clock signal and to said control signal for developing an enable signal;

means for coupling said clock signal to said master counter; and

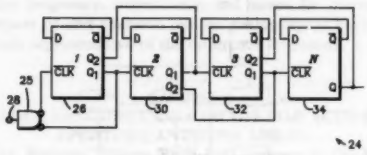
gate means responsive to said enable signal for coupling said clock signal to said slave counter, said enable signal inhibiting clocking of said slave counter in response to successively occurring, like polarity transitions of the outputs of said slave counter and said master counters respectively so as to force coincidence between the succeeding opposite polarity transitions of the outputs of the counters, whereby operation of said slave counter is synchronized to operation of said master counter.

4,521,898

RIPPLE COUNTER CIRCUIT HAVING REDUCED PROPAGATION DELAY

M. Faheem Akram, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 28, 1982, Ser. No. 453,974
Int. Cl.³ H03K *23/26*
U.S. Cl. 377—116 **4 Claims**



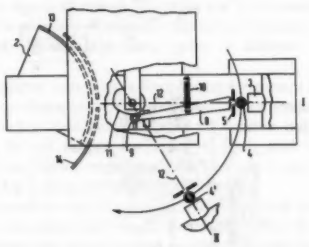
1. A ripple counter circuit having reduced propagation delay comprising a plurality of flip-flops, each flip-flop having a clock input, a first output, and a second output, wherein said clock input of a first flip-flop is responsive to a clock signal, said clock input of a second flip-flop is coupled to said first output of said first flip-flop and said clock signal, each subsequent flip-flop of said plurality of flip-flops having its clock input coupled only to the first output of the preceding flip-flop and the second output of the next preceding flip-flop.

4,521,899

DENTAL X-RAY DIAGNOSTIC DEVICE

Johann Finkenzeller, and Wolfgang Mittelstaedt, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 19, 1982, Ser. No. 442,898
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149723
Int. Cl.³ A61B *6/14*
U.S. Cl. 378—40 **8 Claims**



1. In a dental X-ray diagnostic device for producing panoramic layer exposures of a subject particularly panoramic layer exposures of a jaw, said device comprising an X-ray source, carriage means having an arm for supporting the X-ray source, a cassette accepting X-ray film, said cassette being mounted for relative movement on the arm of the carriage means, said carriage means moving both the X-ray source and cassette around a subject with the cassette being moved relatively on the arm and a slit diaphragm means comprising a slit diaphragm being positioned between the source and the subject for limiting the width of a beam of radiation being projected from the source, the improvement comprising means for changing the layer thickness to match the subject during the entire exposure including adjustment means for changing the effective width of the slit diaphragm during an exposure, said adjustment means including means for mounting the slit diaphragm for rotation on a vertical axis to change the effective

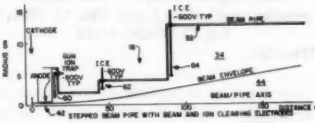
width of the slit and a cam plate coupled to said slit diaphragm to control the rotation thereof, said cam plate being designed in such a manner that the slit diaphragm is rotated to a position to constrict the effective slit width of the diaphragm to achieve a greater layer thickness while exposing the area of the front teeth.

4,521,900

ELECTRON BEAM CONTROL ASSEMBLY AND METHOD FOR A SCANNING ELECTRON BEAM COMPUTED TOMOGRAPHY SCANNER

Roy E. Rand, Palo Alto, Calif., assignor to Imatron Associates, South San Francisco, Calif.

Filed Oct. 14, 1982, Ser. No. 434,252
Int. Cl.³ H01J *35/00, 35/04, 35/24*
U.S. Cl. 378—137 **30 Claims**



1. In a computed tomography X-ray scanning system, an electron beam production and control assembly for producing X-rays, said assembly comprising:

(a) a housing defining an elongated, vacuum sealed chamber having opposite forward and rearward ends;

(b) means for evacuating said chamber of any gases therein;

(c) means for producing an electron beam within said chamber and for directing said beam along a path therethrough from its rearward end to its forward end so as to impinge on a suitable target which is located at the forward end for providing X-rays and which forms part of the scanning system, the electrons forming said beam interacting with any residual gas for producing positive ions, said electron beam forming at least one negative potential well at a fixed point along its path, said potential well trapping said ions therein and preventing the latter from escaping from said beam whereby to have the effect of neutralizing the space charge of the electron beam; and

(d) means for acting on said trapped ions, if present, in a way which reduces the neutralizing effect they would otherwise have on said beam, said means acting on said trapped ions including means for removing said trapped ions from said potential well or wells and from the beam all together in order to prevent those ions from neutralizing said beam.

4,521,901

SCANNING ELECTRON BEAM COMPUTED TOMOGRAPHY SCANNER WITH ION AIDED FOCUSING

Roy E. Rand, Palo Alto, Calif., assignor to Imatron Associates, South San Francisco, Calif.

Filed Mar. 1, 1983, Ser. No. 471,199
Int. Cl.³ H01J *35/30, 35/14*
U.S. Cl. 378—138 **22 Claims**

1. An electron beam production and control assembly especially suitable for use in producing X-rays in a computed tomography X-ray scanning system, said assembly comprising:

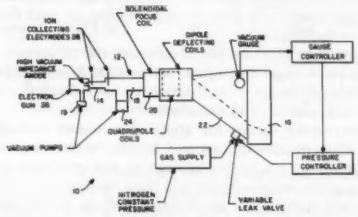
(a) a housing defining an elongated vacuum-sealed chamber having opposite rearward and forward ends;

(b) a target located at the forward end of said chamber, said target being the type which produces X-rays when impinged by an electron beam;

(c) means for producing an electron beam within said chamber at its rearward end and for directing the beam along a path towards the forward end of the chamber in a continuously expanding manner;

(d) focusing means located within said chamber at a location intermediate its rearward and forward ends and in the path of said beam for directing said beam towards said target in a continuously converging manner whereby to impinge on said target for producing X-rays; and

(e) means for neutralizing the converging segment of said beam in a controlled manner sufficient to cause it to converge to a greater extent at the time it impinges said X-ray target than it otherwise would have in the absence of said controlled neutralization, whereby to decrease the area of said target impinged by said converging beam segment, said neutralizing means including means for maintaining



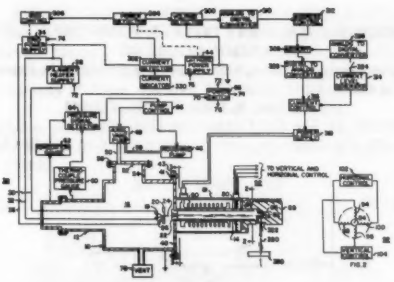
the gas pressure at a preset level within the section of said chamber containing the converging beam segment, said gas pressure maintaining means including means for leaking a specific gas into said chamber section containing said converging beam segment in a controllable manner, means for pumping gas out of said chamber section, means for sensing the pressure within said chamber section, and means responsive to said sensing means for controlling said gas leaking means for maintaining the gas pressure within said chamber at said preset level.

4,521,902

MICROFOCUS X-RAY SYSTEM

Richard S. Peugeot, Stone Mountain, Ga., assignor to Ridge, Inc., Tucker, Ga.

Filed Jul. 5, 1983, Ser. No. 510,660
Int. Cl.³ H05G *1/00, 1/64*
U.S. Cl. 378—138 **5 Claims**



1. An X-ray system comrising:

an elongated vacuum enclosure having first and second vacuum chambers;

electron beam generation means positioned in said first chamber and comprising a filament-cathode and a grid spaced from said filament-cathode, said grid having an aperture through which an electron beam emitted by said filament-cathode passes in a line which is generally along the longitudinal dimension of said enclosure, said beam passing from said first chamber into said second chamber;

said second chamber being tubular and extending around said electron beam;

a focusing coil wound around said tubular second chamber;

an anode having an opening therethrough for passage of said electron beam, said anode being positioned intermediately between said grid and said focusing coil;

a sintered metal tungsten target positioned at an extreme end of said second chamber which is downstream in terms of the passage of said beam, and said target being electrically connected to said anode;

a first pair of beam deflection coils positioned on first and second opposite sides of said second chamber and positioned, with respect to said electron beam, between said said focusing coil and said target, and a second pair of deflection coils positioned on opposite sides of said second chamber, orthogonally with respect to, said first pair of deflection coils;

a window of X-ray permeable material positioned adjacent to said target through which emitted X rays, responsive to bombardment of said target by said electron beam, pass from said second chamber;

first biasing means for applying a heater voltage to said filament-cathode, second biasing means for adjustably applying a negative voltage to said grid with respect to said filament-cathode, and third biasing means for adjustably applying an accelerating voltage to said anode, said accelerating voltage being connected as a ground potential to said anode and as a negative potential on said filament-cathode;

power control means responsive to both the voltage of said third biasing means and electron beam current passing in circuit between said filament-cathode and target for controllably adjusting the voltage of said second biasing means for effecting a grid bias of a value for maintaining a selected value of electron beam power within the range of 0 to 800 watts;

focusing control means coupled to said focusing coil and responsive to the voltage of said third biasing means for applying an electrical input to said focusing coil of a level which varies as a function of anode-to-filament-cathode voltage for maintaining an electron spot size within the range of 10 to 100 microns; and

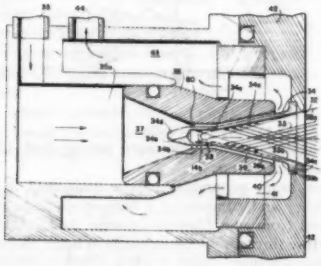
pressure sensing means for providing an electrical output representative of the pressure within said housing, and pumping means responsive to said electrical signal for maintaining a vacuum pressure in said enclosure of between 10 to 10^{-6} Torr.

4,521,903

HIGH POWER X-RAY SOURCE WITH IMPROVED ANODE COOLING

Martin Braun, San Jose, Calif., assignor to Micronix Partners, Los Gatos, Calif.

Filed Mar. 9, 1983, Ser. No. 473,483
Int. Cl.³ G21K *5/00*; H01J *35/00*
U.S. Cl. 378—141 **19 Claims**



1. In an X-ray generator having a target anode with a hollow substantially converging cross-sectional inside surface forming the principal region of bombardment by a beam of charged particles entering the hollow target anode from an open base end, to cause the emission of x-rays therefrom and having means for dissipating and removing generated heat in direction away from said region of bombardment, the improvement comprising:

(a) said surface being truncated at its smaller diameter end opposite its larger diameter open base end; and

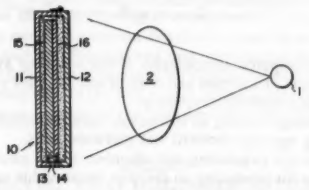
(b) a hollow extension connected to said truncated end and extending in a direction away from said base end and for a distance greater than the top of a hypothetical apex of said converging surface.

4,521,904

METHOD OF AND CASSETTE FOR TAKING X-RAY PHOTOGRAPH

Masao Takano, Minamiashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Sep. 29, 1982, Ser. No. 428,437
Claims priority, application Japan, Oct. 12, 1981, 56/162381
Int. Cl.³ G03B *41/16*
U.S. Cl. 378—185 **7 Claims**



1. A method of taking an X-ray photograph, which comprises maintaining an X-ray film and a stimulable phosphor sheet in close contact with each other and shielded from light, and exposing said X-ray film and said stimulable phosphor sheet to X-rays through an object, whereby an X-ray transmission image of said object is recorded on said stimulable phosphor sheet and, at the same time, said X-ray film is exposed to light instantaneously emitted from stimulable phosphor sheet upon exposure to X-rays to record a photographic latent image of the X-ray transmission image of said object on said X-ray film, processing the image recorded on said stimulable phosphor sheet by scanning said latter sheet with a stimulating ray source to cause said latter image to be emitted as a light image; converting said light image to an electrical signal; processing said electrical signal to obtain an image suitable for viewing; and processing the image recorded on the X-ray film by developing and fixing said latter image to obtain a further image suitable for viewing.

4,521,905

MONITOR OF AN X-RAY RADIATION RANGE

Yoshinori Hosokawa, Kyoto, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Jan. 17, 1983, Ser. No. 459,039
Claims priority, application Japan, Feb. 2, 1982, 57-15900
Int. Cl.³ G01N *23/20*; G21K *1/00*
U.S. Cl. 378—206 **1 Claim**

1. A monitor of an X-ray radiation range for use in a fluorescent X-ray analyzer, said monitor comprising:

an X-ray source for radiating X-rays on a sample to be irradiated;

a collimator arranged along an axis of said X-rays so as to collimate said X-rays;

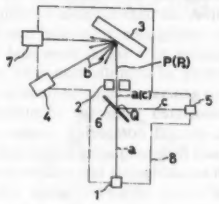
a mirror which is permeable to said X-rays but which reflects visible rays, said mirror being arranged across said axis of said X-rays between said collimator and said X-ray source;

a visible ray source arranged so as to radiate visible rays which are reflected by said mirror and then pass through

said collimator so as to irradiate said sample, said visible rays being irradiated simultaneously with said X-rays;

a fluorescence detector for detecting fluorescence X-rays emitted from said sample in response to said X-rays radiated thereon by said X-ray source;

an optical viewer arranged so as to view a point on said sample upon which said X-rays impinge;



wherein said mirror is inclined at an angle with respect to said X-ray axis so that an axis of said visible rays is substantially identical to said axis of said X-rays radiated by said X-rays source, whereby said point on said sample upon which said X-rays impinge is substantially identical to a point on said sample upon which said visible rays impinge and said point is simultaneously irradiated with both said X-rays from said X-ray source and said visible rays from said visible ray source.

4,521,906

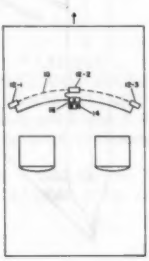
SPEAKER SYSTEMS FOR PRODUCING BALANCED STEREO IMAGES AT MULTIPLE LOCATIONS

Leonard R. Kahn, 137 E. 36 St., New York, N.Y. 10016

Filed Mar. 28, 1983, Ser. No. 479,223

Int. Cl.³ H04R *5/00*

U.S. Cl. 381—24 **1 Claim**



1. A speaker system for use in a vehicle, such as an automobile, in connection with a source of stereophonic signals having a pair of separate left and right stereo audio signal outputs, comprising:

first, second and third speakers arranged along a path extending generally across the width of the passenger compartment of said automobile, wherein said first and third speakers are located at opposite ends of said path and said second speaker is located approximately midway between said first and third speakers;

and means for coupling said first and third speakers to a selected one of said pair of stereo audio signal outputs and said second speaker to the remaining one of said pair of outputs, and for providing independent adjustment of the stereo image balance between said first and second speakers and between said second and third speakers.

4,521,907

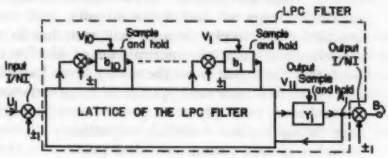
MULTIPLIER/ADDER CIRCUIT

Gideon Amir, San Jose, and Roubik Gregorian, Santa Clara, both of Calif., assignors to American Microsystems, Incorporated, Santa Clara, Calif.

Filed May 25, 1982, Ser. No. 381,807

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—47 **4 Claims**



1. A structure for minimizing error components in the analog output signal of a linear predictive filter which utilizes analog sample and hold circuits to store the forward and backward prediction errors comprising:

means for providing a clock signal having a plurality of clock periods;

means for providing an inverted input signal to said filter during odd numbered clock periods and a noninverted input signal to said filter during even numbered clock periods;

means for storing inverted forward and backward prediction errors in said analog sample and hold circuits during odd numbered clock periods and for storing noninverted forward and backward prediction errors in said analog sample and hold circuits during even numbered clock periods; and

means for inverting the output signal from said filter during odd numbered clock periods and for not inverting the output signal from said filter during even numbered clock periods, thereby shifting the error signal of said linear predictive filter to a frequency of one-half the frequency of said clock signal.

4,521,908

PHASED-ARRAY SOUND PICKUP APPARATUS HAVING NO UNWANTED RESPONSE PATTERN

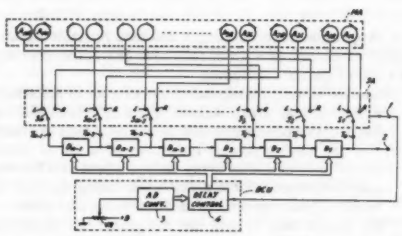
Naotaka Miyaji, Yamato; Atsushi Sakamoto, and Makoto Iwahara, both of Sagamihara, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Aug. 31, 1983, Ser. No. 528,100

Claims priority, application Japan, Sep. 1, 1982, 57-152470; Oct. 7, 1982, 57-176833; Oct. 7, 1982, 57-176834; Oct. 7, 1982, 57-176835

Int. Cl.³ H04M *1/20*

U.S. Cl. 381—92 **18 Claims**



1. A phased-array sound pickup apparatus comprising:

an array of microphones having a first subarray of micro-

phones and a second subarray of microphones, the microphones of said first subarray having individual unidirectional response patterns oriented on one side of the normal to said array and the microphones of said second subarray having individual unidirectional response patterns oriented on the other side of said normal;

a plurality of switches each having first and second switched positions;

a tapped variable delay line having a plurality of successively connected variable delay circuits with taps between successive ones of said delay circuits, said taps being coupled respectively through said switches in the first switched position to the microphones of said first subarray such that the signal from the microphone located at one end of the first subarray opposite to the orientation of said first subarray microphones is given a maximum delay, said taps being further coupled respectively through said switches in said second switched position to the microphones of said second subarray such that the signal from the microphone located on an end of the second subarray opposite to the orientation of the second subarray microphones is given a maximum delay, whereby incremental variable delays are introduced to the signals from said microphones so that the array has a main front lobe oriented on one side of the normal to said array when the switches are transferred to the first terminals and said main front lobe is oriented on the other side of said normal when said switches are transferred to the second terminals, the delayed signals being combined at an output terminal in a phased relationship dependent on the amount of delay introduced by each of said delay circuits; and

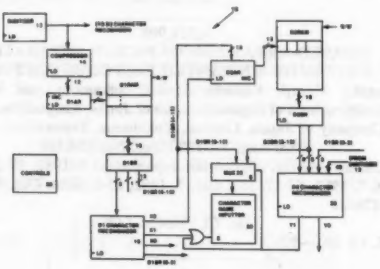
a delay control circuit for controlling said variable delay circuits and said switches in response to a manually adjustable setting.

4,521,909

DUAL LEVEL PATTERN RECOGNITION SYSTEM

Patrick S. Wang, Lexington, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Oct. 4, 1983, Ser. No. 538,858
Int. Cl.³ G06K *9/70*
U.S. Cl. 382—38 **2 Claims**



1. Apparatus for generating a machine readable signal indicating which one of a set of reference characters corresponds to a visible pattern, including

means for storing signals indicative of a set of reference fine n-dimensional array values, each reference fine array value corresponding to one of the reference characters,

means for storing signals indicative of a set of reference coarse m-dimensional array values, where m is less than n, each reference coarse array value being derived either from a signal one only of said reference fine array values (in which case it will be designated an unambiguous value), or from any one of a plurality of said reference fine array values (in which case it will be designated an ambiguous value),

means for measuring with an optical instrument a workpiece visible pattern in each of n fields to provide a signal indicative of a workpiece fine n-dimensional array value and means for storing said last named signal,

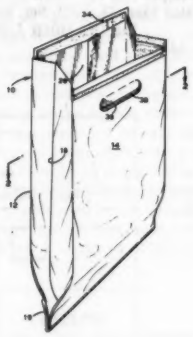
means for forming a signal indicative of a workpiece coarse m-dimensional array value from said workpiece fine array value signal, first comparing means for comparing the signal of the workpiece coarse array value with the signals of the set of reference coarse array values to produce a signal indicating the identification of the workpiece pattern with either an unambiguous reference coarse array value or an ambiguous reference coarse array value, means responsive to a signal from said first comparing means indicative of identification with an unambiguous array value to generate a signal indicative of the reference character associated with the identified unambiguous array value, second comparing means responsive to a signal from said first comparing means indicative of identification with an ambiguous array value to compare signals indicative of values of a preselected subset of elements from the plurality of reference fine array values associated with the identified ambiguous coarse array value with the signals indicative of values of corresponding elements of the workpiece fine array, to generate a signal indicative of identification of the workpiece pattern with a particular one of the reference characters associated with the identified ambiguous value.

4,521,910

MULTIWALL COOLER BAG

Stephen C. Keppel, Ridgefield, Conn.; Donald O. Newton, Washingtonville, N.Y., and Stephen R. Salt, Danbury, Conn., assignors to St. Regis Corporation, New York, N.Y.

Filed Apr. 19, 1984, Ser. No. 602,134
Int. Cl.³ B65D *30/08, 33/08*
U.S. Cl. 383—10 **5 Claims**



1. A multiwall cooler bag comprising inner and outer tubes having front and back walls connected by gussets, the inner tube comprising a ply of heat sealable material having its lower end heat sealed to closure, a strip of reinforcing material extending the length of and secured to the back and front walls of the outer tube, the front wall of the outer tube having its lower end formed with a closure flap overlapping and secured to the back wall of the outer tube, the back wall of the outer tube having its upper end formed with a closure flap overlapping the front wall of the outer tube when the bag is completely closed, the upper portion of the inner tube being free of the outer tube to permit independent closing of the inner tube before closing of the outer tube, an aperture formed in the strip-reinforcing portion and at the upper end of the front and back walls of the outer tube and having a tongue at its upper edge, the tongues being proportioned and arranged for bending through the apertures and upwardly against the upper

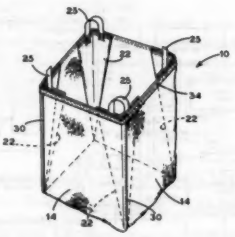
closure flap to cooperate with the upper closure flap to provide a reinforced grip which is an integral part of the bag.

4,521,911

BULK CONTAINER

Robert L. Vance, Sheridan, Ark., assignor to St. Regis Corporation, New York, N.Y.

Filed Jan. 6, 1984, Ser. No. 568,894
Int. Cl.³ B65D *33/02, 33/14*
U.S. Cl. 383—20 **10 Claims**



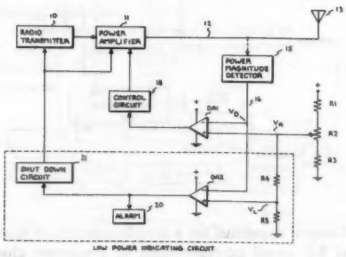
1. A bulk container made from a single rectangular piece of material and folded to provide a bottom wall, four side walls extending from the bottom wall, and four corner flaps each extending between adjacent side walls, each corner flap being integral with the bottom and side walls and folded into at least three portions, the first and second portions being folded against the surfaces of the corresponding side walls, and the third portion being folded against the surfaces of the first and second portions, lifting loops mounted at the corners at the upper edges of the side walls, each loop having two legs disposed intermediate and overlying the third portion and the first and second portions of the corresponding corner flap, the side edges of adjacent side walls being stitched together, the legs of each loop being connected to the corresponding corner flap by stitching passing through the legs and all portions of the corresponding flap.

4,521,912

LOW POWER INDICATING CIRCUIT FOR A RADIO TRANSMITTER

Earnest A. Franke, Goode, and Wayne J. Faulkenberry, Lynchburg, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Jun. 9, 1983, Ser. No. 502,679
Int. Cl.³ H04B *17/00, 1/02*
U.S. Cl. 455—115 **5 Claims**



2. A low power indicating circuit for a radio transmitter comprising:

a. an output power magnitude detector for coupling to the output of said radio transmitter and producing a power magnitude signal related thereto;

b. first means for providing a selectable power magnitude reference signal;

c. second means coupled to said output power magnitude detector and to said first means for producing a feedback signal for application to said radio transmitter to control said output power magnitude as a function of the selected power magnitude provided by said first means;

d. a low power magnitude circuit coupled to said first means for selecting a low power magnitude signal therefrom;

e. third means coupled to said output power magnitude detector and to said low power magnitude circuit for producing a low power signal in response to said power magnitude signal being less than said low power magnitude signal;

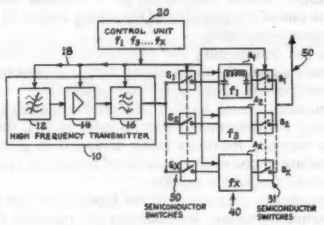
f. and means coupled to said third means for providing an alarm in response to said low power signal.

4,521,913

MULTIFREQUENCY ANTENNA MATCHING APPARATUS WITH AUTOMATIC TUNING

Franz R. Huber, Assling, and Axel Stark, Munich, both of Fed. Rep. of Germany, assignors to Rohde & Schwarz GmbH & Co., KG, Munich, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,715
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1981, 3127566
Int. Cl.³ H04B *1/02*
U.S. Cl. 455—121 **4 Claims**



1. An apparatus for matching the impedance of an antenna with the output impedance of a transmitter which generates an output signal having a frequency that varies according to a predetermined frequency scheme, comprising:

a plurality of antenna tuning means, each being automatically tunable to a plurality of frequencies and each having an input for receiving the output signal from the transmitter and an output for coupling to the antenna, the number of said antenna tuning means being less than the number of different frequencies in said predetermined frequency scheme;

first switching means for selectively providing an automatically controllable connection between the transmitter and any selected one of the inputs of said antenna tuning means; and

control means for automatically controlling said first switching means and for automatically tuning said antenna tuning means so that, for each of the frequencies in the predetermined frequency scheme, a selected one of said antenna tuning means is automatically tuned to match the impedance of the antenna with the output impedance of the transmitter, and the input of said selected antenna tuning means is automatically connected to the transmitter;

said control means repeatedly retuning at least one of the tuning means such that said at least one of the tuning means is automatically successively tuned to multiple ones of the frequencies in the predetermined frequency scheme during the transmission of signals from the transmitter to the antenna.

4,521,914

CIRCUIT ARRANGEMENT FOR INDICATING THE NAMES OF BROADCASTING STATIONS IN RADIO OR TV RECEIVERS

Branko Petrovic, Ebersteinweg 9, 1000 Berlin 37, Fed. Rep. of Germany

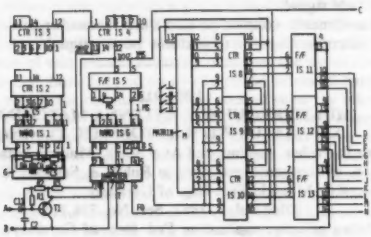
PCT No. PCT/DE81/00208, § 371 Date Jul. 19, 1982, § 102(e) Date Jul. 19, 1982, PCT Pub. No. WO82/01968, PCT Pub. Date Jun. 10, 1982

PCT Filed Nov. 25, 1981, Ser. No. 403,629

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3045037; Jan. 29, 1981, 3103377

Int. Cl.³ H04B 1/16

U.S. Cl. 455—158 **8 Claims**



1. A circuit arrangement for automatically indicating the alphanumeric station designation for a selected received frequency in one of the plurality of frequency ranges in a radio or TV receiver comprising:

means for determining the frequency of the received frequency signal, the determining means generating a signal corresponding to the received frequency;

first memory means having addressable memory locations storing pre-determined address information, the addressable memory locations being arranged in groups corresponding to one of the plurality of frequency ranges of the received frequency signals;

counter means, responsive to the signal from the frequency determining means, for counting the received frequency, the counter means addressing the first memory means for outputting address information therefrom;

means for pre-setting the counter means to 0 for the lowest received frequency in each range of received frequencies;

second memory means having addressable memory locations storing pre-determined alphanumeric station designations;

the output from the first memory means addressing the second memory means; and

indicator means, responsive to the output information from the second memory means, for displaying the station designation of the received frequency signal.

4,521,915

PROCESSOR CONTROLLED, SCANNING RADIO RECEIVER HAVING TABULAR STORAGE OF SERVICE BAND FREQUENCY CODES

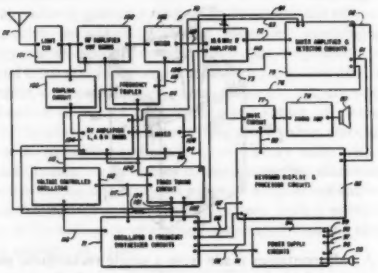
William Baker, Indianapolis, Ind.; Gordon H. Smith, Santa Ana, Calif.; Xio I. Beach, Long Beach, Calif.; Gary F. Sallee, Yorba Linda, Calif., and Jeffrey I. Stein, Garden Grove, Calif., assignors to Masco Corporation of Indiana, Cumberland, Ind.

Filed May 28, 1980, Ser. No. 154,088

Int. Cl.³ H03J 7/18

U.S. Cl. 455—165 **8 Claims**

1. In a scanning radio receiver, including frequency synthesizer means for generating a local oscillator signal for mixing with a received signal to produce an IF signal at a certain IF frequency, said frequency synthesizer means being digitally controlled and being responsive to an applied frequency code to develop a local oscillator frequency for reception of a signal at a frequency corresponding to the applied frequency code, a detector circuit including means for developing on a signal present line a signal indicating the receipt of a signal by the receiver, processor means including read only memory means for storing service group identification data which identifies a plurality of service bands each including a group of frequencies differing from one another by a certain incremental value with a limit frequency of the group being identified by a first data portion and with the number of frequencies in the group being identified by a second data portion, keyboard means for supplying control data for selection of said service bands, means connecting said processor means to said signal present



line and to said keyboard means, said processor means including code-developing means responsive to control data from said keyboard means and to corresponding service group identification data from said read only memory means for developing a series of frequency codes corresponding to said limit frequency and frequencies differing therefrom and from each other by said certain incremental values with the number of frequency codes in said series being equal to the number of frequencies in said group, output means for sequential output of said series of codes to said synthesizer means, and means for inhibiting operation of said output means in response to a signal on said signal present line.

4,521,916

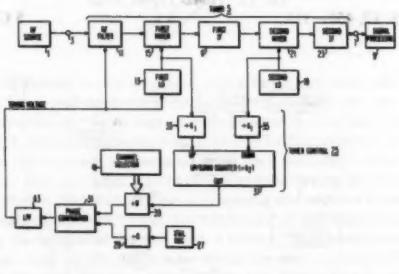
FREQUENCY SYNTHESIS TUNING CONTROL SYSTEM FOR A DOUBLE-CONVERSION TUNER

Charles M. Wine, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 29, 1983, Ser. No. 556,356

Int. Cl.³ H04B 1/26

U.S. Cl. 455—182 **15 Claims**



1. Control apparatus for a double-conversion tuner for tuning an RF signal corresponding to a selected channel, said double-conversion tuner including a first oscillator for generating a first local oscillator signal having a frequency controlled in response to a control signal and a second local oscillator for generating a second local oscillator signal, comprising:

counting means having first and second inputs coupled to receive first and second input pulse signals for producing at an output an output pulse signal having a number of pulses in a given time interval which number increases with each pulse of one said input pulse signals in said given time interval and which number decreases with each pulse of the other one of said input pulse signals in said given time interval;

first coupling means for coupling said first local oscillator signal to said first input of said counting means as said second input pulse signal;

second coupling means for coupling said second local oscillator signal to said second input of said counting means as said second input pulse signal;

a source of a reference frequency signal; and

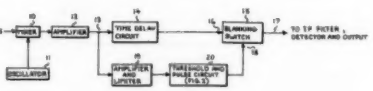
comparing means for comparing the frequency of said output pulse signal of said counting means and the frequency of said reference frequency signal to generate said control signal for said first local oscillator.

4,521,917

NOISE BLANKING CIRCUIT AND METHOD

John R. Holt, Jr., Rustburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Nov. 14, 1983, Ser. No. 551,401
Int. Cl.³ H04B *1/10*
U.S. Cl. 455—223 **7 Claims**



4. A method for blanking noise signals present in information signals provided by a receiving device, comprising the steps of:

a. amplifying the received signals;

b. limiting the amplitude of the amplified signals;

c. detecting the amplitude of the limited signals;

d. providing an output in response to the detected signals exceeding a selected amplitude threshold in less than a predetermined time following the beginning of each detected signal;

e. generating a pulse of selected time duration in response to the provided output;

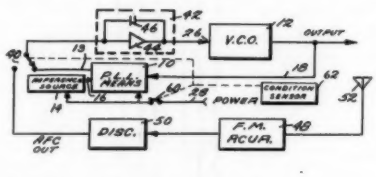
f. and utilizing the pulse to prevent the received signals from being used for the duration of the pulse.

4,521,918

BATTERY SAVING FREQUENCY SYNTHESIZER ARRANGEMENT

Richard F. Challen, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Nov. 10, 1980, Ser. No. 205,516
Int. Cl.³ H04B *1/02*; H03L *7/02, 7/06*
U.S. Cl. 455—343 **4 Claims**



1. A frequency synthesizer circuit comprising:

a voltage controlled oscillator (VCO) having a control input;

an integrator having an output coupled to said VCO control input and an input;

phase-locked loop (PLL) synthesizer means for comparing a signal output of said VCO with a signal from a reference oscillator and (b) providing a loop control signal related thereto;

means for applying and interrupting power to the PLL synthesizer means;

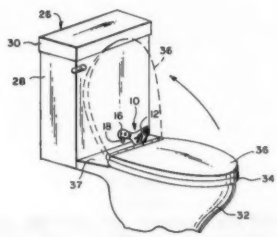
switch means for selectively coupling the input of the integrator to either (a) the loop control signal from the PLL synthesizer means when power is applied thereto or (b) a receiver discriminator signal derived from a discriminator separate and distinct from said PLL synthesized means when power to the PLL synthesizer means is interrupted, whereby the frequency of the VCO is controlled by the receiver discriminator signal during periods of power interruption to the PLL synthesizer means.

4,521,919

BATHROOM RADIO

Lawrence Molloy, 12 Welwyn Rd. Apt. 1G, Great Neck, N.Y. 11021

Filed Aug. 30, 1983, Ser. No. 527,782
Int. Cl.³ H04B *1/08*
U.S. Cl. 455—344 **4 Claims**



1. A bathroom radio which comprises:

(a) a radio circuit;

(b) a housing to hold said radio circuit within in the form of an animal having a head;

(c) means for securing said housing in a place between a toilet tank and a toilet seat cover;

(d) a pressure sensitive switch located within the head of said animal electrically connected to said radio circuit so that when the toilet seat is lifted up the cover will press against said pressure sensitive switch to close said radio circuit and when the toilet seat cover is placed back down said pressure sensitive switch will open turning said radio circuit off

(e) a tuner to change the radio stations;

(f) a battery compartment to store a battery so that said housing can be opened to remove and replace said battery when needed; and

(g) a flexible ring contained in said head of said animal so that said pressure sensitive switch can be positioned to make contact with said seat cover.

4,521,920

METHOD AND AN ARRANGEMENT FOR INCREASING THE DYNAMIC RANGE AT THE INPUT STAGE OF A RECEIVER IN AN OPTICAL FIBRE INFORMATION TRANSMISSION SYSTEM

Gunnar Forsberg, Stockholm, and Lars Ingre, Huddinge, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE81/00238, § 371 Date Apr. 5, 1982, § 102(e) Date Apr. 5, 1982, PCT Pub. No. WO82/00931, PCT Pub. Date Mar. 18, 1982

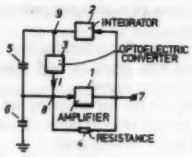
PCT Filed Aug. 25, 1981, Ser. No. 365,504

Claims priority, application Sweden, Sep. 1, 1980, 8006098

Int. Cl.[3] H04B 9/00

U.S. Cl. 455—619 7 Claims

1. A method of increasing the dynamic range in a transimpedance type of input stage in a receiver of an optical fibre information transfer system having as an optical input a two-terminal non-amplifying photodiode with a parallel capacitance with one of the terminals of the photodiode being connected to the input of a high impedance amplifier, said method comprising the steps of integrating the output signal of said high impedance amplifier and feeding the resulting integrated

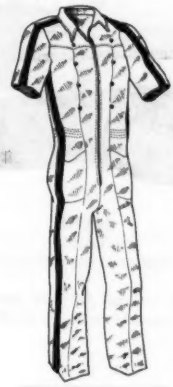


signal to the other terminal of the photodiode and capacitive coupling the integrated signal received at said other terminal to said input of the high impedance amplifier.

279,040
HOSPITAL GOWN
Joan R. Horox, 211 Tangelo Dr., Clairton, Pa. 15025
Filed Mar. 8, 1982, Ser. No. 355,515
Term of patent 14 years
U.S. Cl. D2—25

279,041
PANTS
I. Weir Sears, Davenport; John E. Hostetler, Bettendorf, and William H. Hulsebusch, DeWitt, all of Iowa, assignors to Apparel Form Company, Davenport, Iowa
Filed Jul. 6, 1982, Ser. No. 395,820
Term of patent 14 years
U.S. Cl. D2—28

279,042
JUMP SUIT
Eddie O. Aquilina, deceased, late of Palm Springs, Calif., and Lacadena Aquilina, heir, 327 Sanchez St., Santa Fe, N. Mex. 87501
Filed Dec. 15, 1982, Ser. No. 434,506
Term of patent 14 years
U.S. Cl. D2—29



279,043
JEANS
Ben F. Stanley, 198 Wade Dr., Windsor, Calif. 95492
Filed Mar. 14, 1983, Ser. No. 474,791
Term of patent 14 years
U.S. Cl. D2—29

279,044

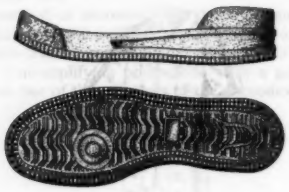
OUTSOLE FOR ATHLETIC SHOE

Edward J. Norton, Kingston, N.H.; Ronald L. Clay, W. Boxford, and Zenon O. Smotrycz, Woburn, both of Mass., assignors to New Balance Athletic Shoe, Inc., Boston, Mass.

Filed Feb. 1, 1983, Ser. No. 462,968

Term of patent 14 years

U.S. Cl. D2—320



279,045

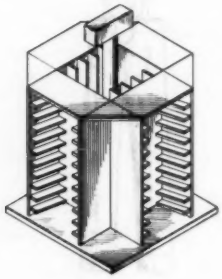
CASSETTE TAPE CAROUSEL

Nathaniel Hall, 618 Hedgeleaf Ave., Capitol Heights, Md. 20743

Filed May 5, 1983, Ser. No. 491,915

Term of patent 14 years

U.S. Cl. D3—35



279,046

TENNIS SUITCASE

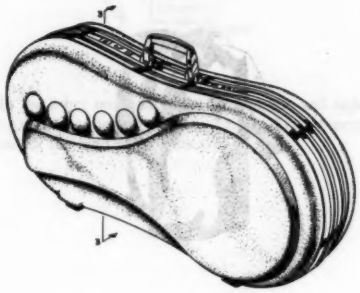
Jarmo A. Soininen, Helsinki, Finland, assignor to Asoma OY, Helsinki, Finland

Filed Aug. 4, 1982, Ser. No. 405,018

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 164/82

Term of patent 14 years

U.S. Cl. D3—36



279,047

TENNIS SUITCASE

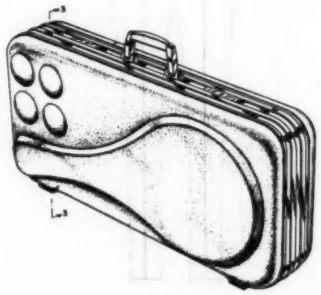
Jarmo A. Soininen, Helsinki, Finland, assignor to Asoma OY, Helsinki, Finland

Filed Aug. 4, 1982, Ser. No. 405,020

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 164/82

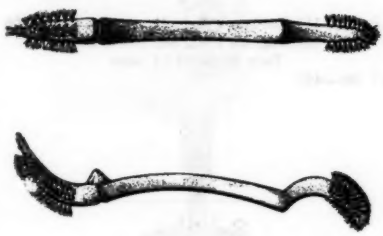
Term of patent 14 years

U.S. Cl. D3—36



279,048
COMBINED GARMENT BAG AND OVERNIGHT CASE
James H. Allen, Covington, Ky., assignor to 'totes' incorporated, Loveland, Ohio
Filed Apr. 18, 1983, Ser. No. 486,055
Term of patent 14 years
U.S. Cl. D3—71

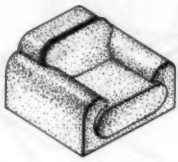
279,049
COMBINED MOUTH BRUSH AND DENTAL PROSTHESIS BRUSH
Tapio Putkonen, Mannerheimintie 27 A 15, Domicile, 00250 Helsinki 25, Finland
Filed Mar. 31, 1983, Ser. No. 480,839
Claims priority, application Finland, Oct. 11, 1982, 885/82
Term of patent 14 years
U.S. Cl. D4—106



279,050
CHILDS TOY
Lowell Tietz, 738 Wheaton Ave., Roseville, Minn. 55113
Filed Sep. 1, 1982, Ser. No. 413,800
Term of patent 14 years
U.S. Cl. D6—348

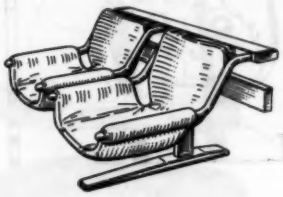
279,051
CLOTHES HANGER
Rosalie C. Shockley, 12 Running Deer, Benton, La. 71006
Filed Jan. 13, 1983, Ser. No. 457,764
Term of patent 14 years
U.S. Cl. D6—316

279,052
SEAT
R. J. McDonald, 166-41 Powells Cove Bldg., Whitestone, N.Y. 11357
Filed Mar. 29, 1983, Ser. No. 465,489
Term of patent 14 years
U.S. Cl. D6—334

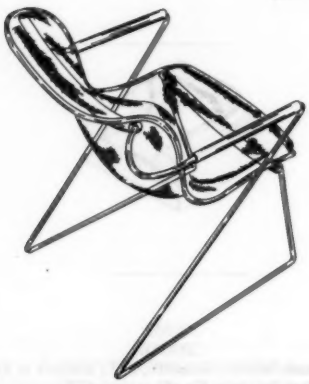


279,053
CHAISE
Robert D. Vanderminden, Granville, N.Y., assignor to The Telescope Folding Furniture Co., Granville, N.Y.
Filed Mar. 31, 1983, Ser. No. 480,743
Term of patent 14 years
U.S. Cl. D6—361

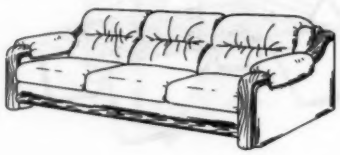
279,054
SEAT
Edward F. Longley, 615 Lyons Ct., Milton, Ontario, L9T 4R7, Canada, and Maurice Burke, P.O. Box 55, Warwick CV34 5HY, England
Filed Jul. 23, 1982, Ser. No. 401,161
Term of patent 14 years
U.S. Cl. D6—362



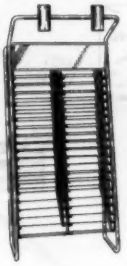
279,055
CHAIR
Charles R. Pollock, 34-24 86th St., Jackson Heights, N.Y. 11372
Filed Sep. 15, 1982, Ser. No. 418,511
Term of patent 14 years
U.S. Cl. D6—373



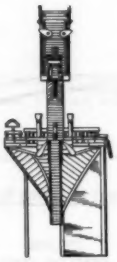
279,056
SOFA
Deborah L. Nelson, High Point, N.C., assignor to The Bean Station Furniture Factory, Bean Station, Tenn.
Filed Feb. 7, 1983, Ser. No. 464,340
Term of patent 14 years
U.S. Cl. D6—381

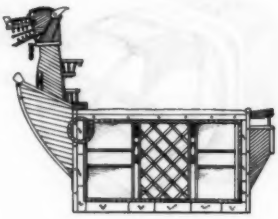


279,057
COMBINED MODULAR DISPLAY RACK AND LIGHTING FIXTURES UNIT
Richard Bolduc, Quebec, Canada, assignor to Domco Industries Ltd., Lachine, Canada
Filed Aug. 9, 1982, Ser. No. 406,381
Term of patent 14 years
U.S. Cl. D6—399

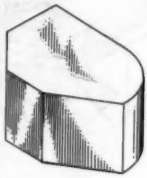


279,058
BAR
Rene P. Roy, 112 Sherbrook Ave., Hartford, Conn. 06106
Filed Aug. 27, 1982, Ser. No. 412,356
Term of patent 14 years
U.S. Cl. D6—453



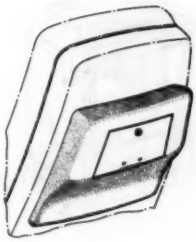


279,059
TABLE
Paul Tekel, 515 SW. 62nd Ave., Plantation, Fla. 33317
Filed Sep. 29, 1982, Ser. No. 427,749
Term of patent 14 years
U.S. Cl. D6—482

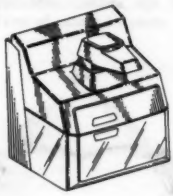


279,060
REVERSIBLE SEAT CUSHION AND BACK REST UNIT
M. Bernard Sheppard, 1031 Redondo Blvd., Los Angeles, Calif. 90019
Filed Sep. 1, 1982, Ser. No. 413,669
Term of patent 14 years
U.S. Cl. D6—502

279,061
CAR SEAT BACK STORAGE COMPARTMENT
Steven Zabielinsky, 7573 SW. 96th Ct., Miami, Fla. 33173
Filed Sep. 17, 1982, Ser. No. 419,222
Term of patent 14 years
U.S. Cl. D6—509

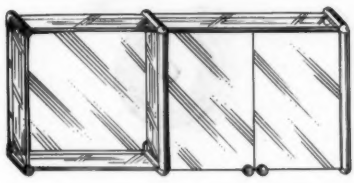


279,062
LIQUID DISPENSER
Joseph S. Kanfer, 2825 N. Walnut Ridge, Akron, Ohio 44313
Filed May 31, 1983, Ser. No. 499,314
Term of patent 14 years
U.S. Cl. D6—545



279,063
SOAP DISPENSER
George O. Haskell, III, and Francis J. Perzinski, both of Macon, Ga., assignors to Southern Chemical Products Co., Macon, Ga.
Filed Oct. 19, 1983, Ser. No. 543,474
Term of patent 14 years
U.S. Cl. D6—545

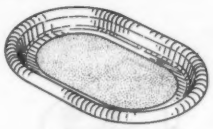
279,064
COMBINED MIRROR CABINET AND SHELF UNIT
Winfried Scholl, Düsseldorf, Fed. Rep. of Germany, assignor to HEWI GmbH, Fed. Rep. of Germany
Division of Ser. No. 301,435, Sep. 11, 1981,. This application May 14, 1984, Ser. No. 609,965
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1981, MR 162; Mar. 14, 1981, MR 163; Mar. 14, 1981, MR 164; Mar. 14, 1981, MR 165; Mar. 14, 1981, MR 166; Mar. 14, 1981, MR 167; Mar. 14, 1981, MR 168; Mar. 14, 1981, MR 169; Mar. 14, 1981, MR 170; Mar. 14, 1981, MR 171
Term of patent 14 years
U.S. Cl. D6—561

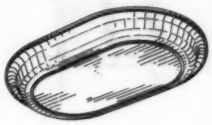


279,065
TUREEN
Walter Everhan, Weisshausstrasse 34-38, D-5000 Kohn 41, Fed. Rep. of Germany
Filed Nov. 3, 1982, Ser. No. 438,983
Term of patent 14 years
U.S. Cl. D7—17

279,066
SUGAR BOWL
Walter Everhan, Weisshausstrasse 34-38, D-5000 Kohn 41, Fed. Rep. of Germany
Filed Nov. 3, 1982, Ser. No. 438,984
Term of patent 14 years
U.S. Cl. D7—17

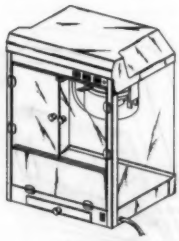
279,067
SERVING TRAY OR THE LIKE
Martin Kuster, 378 Queen St. E., Toronto, Ontario, Canada
Filed Oct. 19, 1982, Ser. No. 435,288
Term of patent 14 years
U.S. Cl. D7—37





279,068
DISPENSING FUNNEL FOR MELTED CANDY
Ralph R. Burin, Glen Ellyn, Ill., assignor to Wilton Enterprises, Inc., Woodridge, Ill.
Filed Dec. 2, 1982, Ser. No. 446,349
Term of patent 14 years
U.S. Cl. D7—312

279,069
CORN POPPER
John D. Goodlaxson, 701 S. Goodrich, Colfax, Iowa 50054
Filed Sep. 29, 1982, Ser. No. 427,779
Term of patent 14 years
U.S. Cl. D7—325



279,070

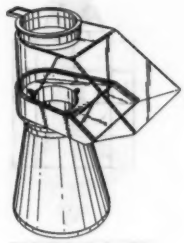
HOT AIR POPCORN POPPER

Thurber H. Morrison, Evanston; Robert W. Becker, Naperville, and Robert S. Huff, Oak Park, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.

Filed Mar. 17, 1983, Ser. No. 476,119

Term of patent 14 years

U.S. Cl. D7—325



279,071

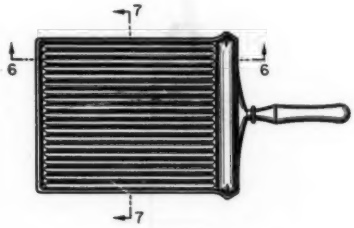
BROILING GRILL

Liviu Christea, 26-45 Ninth St., Astoria, N.Y. 11102

Filed Aug. 30, 1982, Ser. No. 412,778

Term of patent 14 years

U.S. Cl. D7—359



279,072

KITCHEN MACHINE BASE UNIT

Marten F. Elkerbout, Pieze, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1983, Ser. No. 456,946

Claims priority, application Benelux, Jul. 13, 1982, 57015-01; Jul. 13, 1982, 57015-02

Term of patent 14 years

U.S. Cl. D7—386

279,073

STOVE GUARD

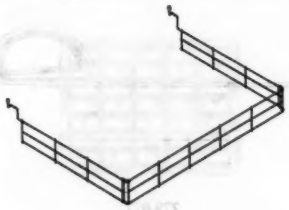
Nicholas R. Simpson, 100 Sunvalley Drive S.E., Calgary, Alberta, Canada (T2X 1W3), and Ronald U. Rempe, 3307 Barrett Place N.W., Calgary, Alberta, Canada (T2L 1W5)

Filed Oct. 28, 1983, Ser. No. 546,351

Claims priority, application Canada, Apr. 28, 1983, 28034831

Term of patent 14 years

U.S. Cl. D7—402



279,074

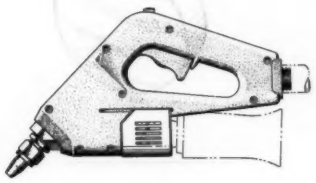
HAND HELD ADHESIVE GUN

R. Blakeley Honeyman, Carmel; Thomas D. Taggart, Pacific Grove, and Robert E. Taggart, Carmel, all of Calif., assignors to Lockwood Technical, Inc., Monterey, Calif.

Filed May 24, 1982, Ser. No. 381,323

Term of patent 14 years

U.S. Cl. D8—14.1



279,075

HAND HELD HOT MELT DISPENSER

Octavio Nuesse; Rainer Samson, both of Muenster, and Karl Majert, Herne, all of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Nov. 16, 1982, Ser. No. 442,176

Claims priority, application Fed. Rep. of Germany, May 17, 1982, 10MR607

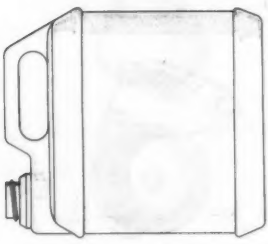
Term of patent 14 years

U.S. Cl. D8—30

279,076
PAPER CUTTING KNIFE
Toru Hayashi, 1 Obora, Seki, Gifu, 501-32, Japan
Filed Oct. 6, 1982, Ser. No. 433,168
Term of patent 14 years
U.S. Cl. D8—102

279,077
BOTTLE
Archie G. Drummond, Jr., Paletine, and Dale E. Fahnstrom, Riverside, both of Ill., assignors to Helene Curtis Industries, Inc., Chicago, Ill.
Filed Jan. 17, 1983, Ser. No. 458,274
Term of patent 14 years
U.S. Cl. D9—371

279,078
OIL CONTAINER
Thomas A. Franchi, Cobham, England, and Leslie B. Rogers, Red Bank, N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Jan. 3, 1983, Ser. No. 455,359
Term of patent 14 years
U.S. Cl. D9—376



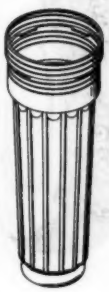
279,079
BOTTLE
Marie-Annick H. Courtout, Paris, France, assignor to Courreges Parfums, France
Filed Mar. 18, 1983, Ser. No. 476,464
Claims priority, application France, Sep. 27, 1982, 82 3254
Term of patent 14 years
U.S. Cl. D9—410

279,080
CONTAINER CLOSURE
Fumio Negishi, Torrance, Calif., assignor to Three Bond Co., Ltd., Hachioji, Japan
Filed Apr. 4, 1983, Ser. No. 482,330
Term of patent 14 years
U.S. Cl. D9—453

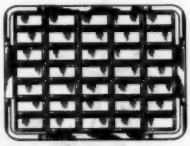
279,081
WATCH
Susumu Suzuki; Noritaka Uchihori, and Naoto Fukazawa, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Feb. 11, 1983, Ser. No. 465,718
Claims priority, application Japan, Aug. 11, 1982, 57-36343
Term of patent 14 years
U.S. Cl. D10—38

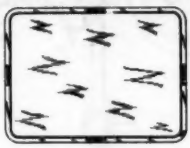
279,082
EARRING
Marina Bulgari, Athens, Greece, assignor to Marina B. Creations, S.A., Vaduz, Liechtenstein
Filed Jun. 6, 1983, Ser. No. 501,376
Claims priority, application Italy, Dec. 6, 1982, 36196/82[U]
Term of patent 14 years
U.S. Cl. D11—43

279,083
CONTAINER FOR PLANTS
Jack V. Gray, 13791 Jackson St., Garden Grove, Calif. 92643
Filed Feb. 18, 1983, Ser. No. 467,777
Term of patent 14 years
U.S. Cl. D11—152

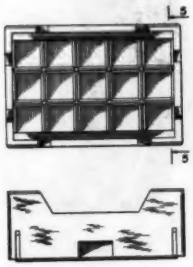


279,084
BOX FOR CULTIVATING VEGETABLES OR THE LIKE
Toshiro Kaneko, 20-3, Nakashinden, Yaizu-shi, Shizuoka-ken, Japan
Filed Oct. 18, 1983, Ser. No. 543,099
Term of patent 14 years
U.S. Cl. D11—155

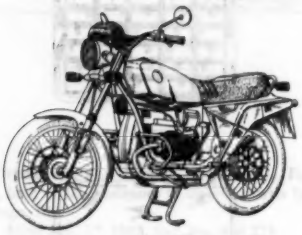




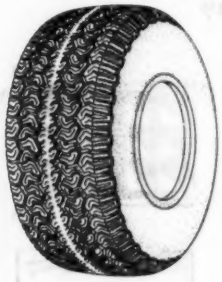
279,085
BOX FOR CULTIVATING VEGETABLES OR THE LIKE
Toshiro Kaneko, 20-3, Nakashinden, Yaizu-shi, Shizuoka-ken, Japan
Filed Dec. 23, 1983, Ser. No. 565,183
Term of patent 14 years
U.S. Cl. D11—155



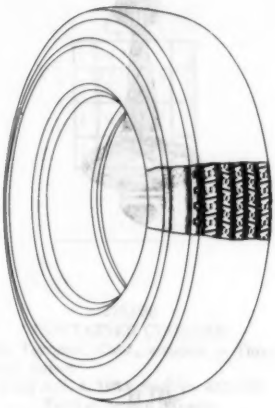
279,086
MOTORCYCLE
Klaus V. Gevert, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke, AG, Fed. Rep. of Germany
Filed Dec. 30, 1982, Ser. No. 454,539
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, MR 13067
Term of patent 14 years
U.S. Cl. D12—110



279,087
TIRE
Timothy J. Lassan, Kent, and Richard J. Skerl, Barberton, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio
Filed Jan. 18, 1983, Ser. No. 459,020
Term of patent 14 years
U.S. Cl. D12—147



279,088
TIRE
Daniel Giron, Greer, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Aug. 29, 1983, Ser. No. 527,315
Term of patent 14 years
U.S. Cl. D12—147

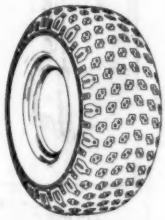


279,089
TIRE
David A. Wright, Louisville, Colo., assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Oct. 3, 1983, Ser. No. 538,701
Term of patent 14 years
U.S. Cl. D12—147

279,090
MOTORCYCLE TIRE

Hiroshi Kojima, and Kiyoshi Takase, both of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

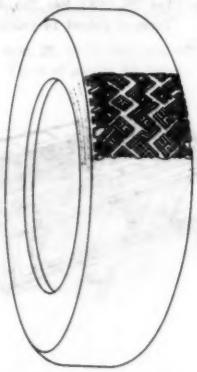
Filed Sep. 8, 1983, Ser. No. 530,433
Claims priority, application Japan, May 6, 1983, 58-18822
Term of patent 14 years
U.S. Cl. D12—149



279,091
TIRE FOR ROAD VEHICLES

Manuel G. Balbis, and Silvana Hinrichsen, both of Rome, Italy, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 27, 1983, Ser. No. 461,360
Claims priority, application Italy, Aug. 4, 1982, 53605/82[U]
Term of patent 14 years
U.S. Cl. D12—151



279,092
TRAILER HITCH GUIDE

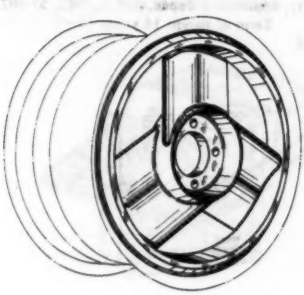
Alvin A. Snaper, 2800 Cameo Cir., Las Vegas, Nev. 89107

Filed Jul. 13, 1982, Ser. No. 397,832
Term of patent 14 years
U.S. Cl. D12—162

279,093
VEHICLE WHEEL CENTER

Donald J. Reid, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Jun. 25, 1982, Ser. No. 392,097
Term of patent 14 years
U.S. Cl. D12—211



279,094

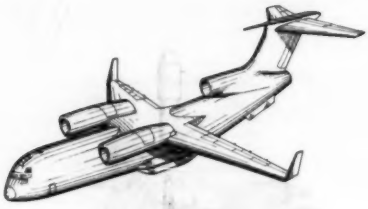
AIRPLANE

Jay A. Ferrell; Lucas J. Kimes, and Robert E. Spitzer, all of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 28, 1982, Ser. No. 382,855

Term of patent 14 years

U.S. Cl. D12—340



279,095

COMBINED TELEVISION AND RADIO RECEIVER AND TAPE RECORDER

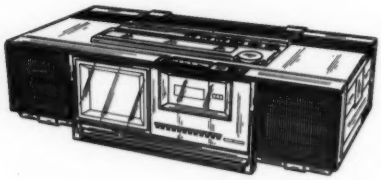
Naoyuki Kato; Takahisa Yuhisui, and Masumi Kanari, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan

Filed Jul. 12, 1982, Ser. No. 397,250

Claims priority, application Japan, Dec. 29, 1981, 56-57947

Term of patent 14 years

U.S. Cl. D14—5



279,096

COMBINED TAPE DECK, PHONOGRAPH, TUNER AND AMPLIFIER

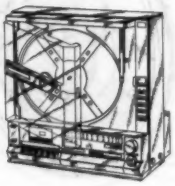
Takao Oura, and Hideki Okada, both of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1982, Ser. No. 444,815

Claims priority, application Japan, Jul. 5, 1982, 57-30278

Term of patent 14 years

U.S. Cl. D14—5



279,097

TAPE RECORDER

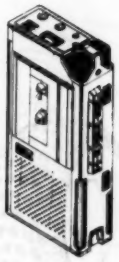
Kazuaki Takata, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,471

Claims priority, application Japan, Sep. 6, 1982, 57-40639

Term of patent 14 years

U.S. Cl. D14—6



279,098

PORTABLE RADIO RECEIVER

Sies K. Brandsma, Eersel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 23, 1982, Ser. No. 422,227

Claims priority, application United Kingdom, Apr. 8, 1982, 1006072

Term of patent 14 years

U.S. Cl. D14—70

279,099

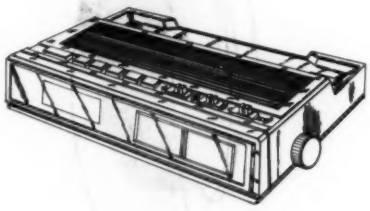
COMBINED CLOCK RADIO AND TELEPHONE BASE

Elliot I. Baum, Dix Hills, N.Y., assignor to QT&T, Inc., Brentwood, N.Y.

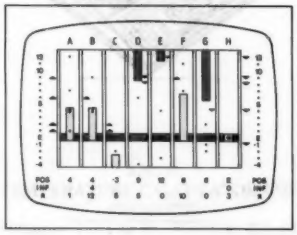
Filed Mar. 21, 1983, Ser. No. 477,176

Term of patent 14 years

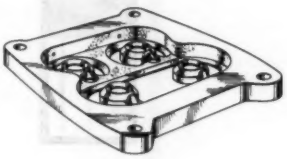
U.S. Cl. D14—73



279,100
VISUAL CONTROL PANEL FOR TELEVISION MONITOR FOR MONITORING THE POSITION OF INDIVIDUAL ELEVATORS OF A GROUP OF ELEVATORS OR SIMILAR ARTICLE
Joris Schröder, Lucerne, and Thomas Hinderling, Ebikon, both of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland
Filed Oct. 25, 1982, Ser. No. 436,529
Claims priority, application Benelux, Apr. 29, 1982, DM/001419
Term of patent 14 years
U.S. Cl. D14—115



279,101
MULTIPLE VENTURI GASOLINE/AIR MIXER
Walter C. Halcomb, Sr., 600 Galaxie, Harrisonville, Mo. 64701; W. Carl Halcomb, Jr., 9220 Ensley La., Leawood, Kans. 66206, and Jeff D. McFerron, 600 James St., Harrisonville, Mo. 64701
Filed Apr. 28, 1983, Ser. No. 489,567
Term of patent 14 years
U.S. Cl. D15—5



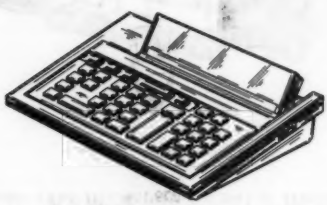
279,102
GUITAR BODY OR THE LIKE
Thomas C. Holmes, 2662 Union Hill Rd., Joelton, Tenn. 37080
Filed Sep. 28, 1981, Ser. No. 306,320
Term of patent 14 years
U.S. Cl. D17—20

279,103
DRUM CLAMP BRACKET
Raymond D. Ayotte, 7600 Malahat Ave., Richmond, British Columbia, Canada (V7A 4G9)
Filed Feb. 23, 1983, Ser. No. 469,080
Term of patent 14 years
U.S. Cl. D17—22

279,104
ELECTRONIC PRINTER WITH CALCULATOR
Noriko Satake, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 10, 1983, Ser. No. 522,191
Claims priority, application Japan, Feb. 14, 1983, 58-5267
Term of patent 14 years
U.S. Cl. D18—2

279,105
ELECTRONIC CALCULATOR
Masaji Sawada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 5, 1983, Ser. No. 455,821
Claims priority, application Japan, Jul. 15, 1982, 57-32169
Term of patent 14 years
U.S. Cl. D18—7

279,106
DESK-TOP CALCULATOR
Masaji Sawada; Hiroshi Sakaguchi; Shigeaki Hayashi, and Kazuo Yamada, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jan. 28, 1983, Ser. No. 461,880
Term of patent 14 years
U.S. Cl. D18—7



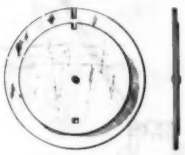
279,107
DESK-TOP ELECTRONIC CALCULATOR
Nobuo Kikuchi, Tokyo, and Hideo Fushimoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 18, 1983, Ser. No. 486,221
Claims priority, application Japan, Oct. 20, 1982, 57-47793
Term of patent 14 years
U.S. Cl. D18—7

279,108
PRINTING CALCULATOR
Masaji Sawada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 25, 1983, Ser. No. 488,115
Claims priority, application Japan, Oct. 25, 1982, 57-48534
Term of patent 14 years
U.S. Cl. D18—7

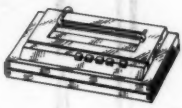
279,109
CALCULATOR
Takahisa Yubisui; Hiroshi Sakaguchi; Keiji Sakata, and Megumi Shinohara, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 27, 1983, Ser. No. 489,155
Claims priority, application Japan, Oct. 27, 1982, 57-49122
Term of patent 14 years
U.S. Cl. D18—7

279,110
ELECTRONIC CALCULATOR WITH PRINTER
Noriko Takahashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 19, 1983, Ser. No. 496,119
Claims priority, application Japan, Nov. 25, 1982, 57-53257
Term of patent 14 years
U.S. Cl. D18—7

279,111
WATER TEMPERATURE CALCULATOR FOR BAKERY PRODUCTS
Peter L. Wilkinson, 231 Fair St., Warwick, R.I. 02888
Filed Sep. 29, 1982, Ser. No. 426,299
Term of patent 14 years
U.S. Cl. D18—10



279,112
PRINTER FOR DESK-TOP ELECTRONIC CALCULATOR
Nobuo Kikuchi, Tokyo, and Hideo Fushimoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 18, 1983, Ser. No. 486,223
Claims priority, application Japan, Oct. 20, 1982, 57-47794
Term of patent 14 years
U.S. Cl. D18—12

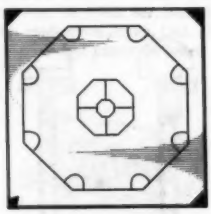


279,113
PORTFOLIO
Betty M. Beall, 1801 Century Park East, Los Angeles, Calif. 90067
Filed Feb. 1, 1983, Ser. No. 463,061
Term of patent 14 years
U.S. Cl. D19—26

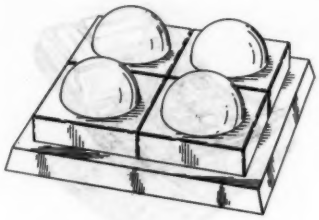
279,114
PEN
Robert Adell, Novi, Mich., assignor to U.S. Product Development Company, Sunnyvale, Tex.
Filed May 19, 1982, Ser. No. 379,581
Term of patent 14 years
U.S. Cl. D19—42

279,115
BALL-POINT PEN
Yoshitsugu Nishida, Tenri, Japan, assignor to Kabushiki Kaisha Kuretake-Seishodo, Nara, Japan
Filed Nov. 10, 1982, Ser. No. 440,638
Term of patent 14 years
U.S. Cl. D19—51

279,116
GAME BOARD
James W. Giallo, Jr., 2995 Woodlawn Ave., San Marino, Calif. 91108
Filed Sep. 23, 1982, Ser. No. 422,208
Term of patent 14 years
U.S. Cl. D21—34



279,117
SHAPE SORTING TOY
Peter G. Adams, Lingfield nr. East Grinstead, England, assignor to Hestair Kiddicraft Limited, Surrey, England
Filed Jun. 3, 1982, Ser. No. 384,542
Claims priority, application United Kingdom, Dec. 3, 1981, 1003972
Term of patent 14 years
U.S. Cl. D21—65

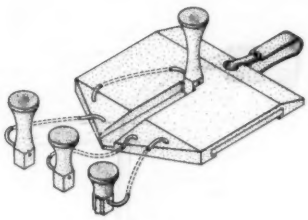


279,118
TOY LAWN TRIMMER
Ronald R. Klawitter, Hermann, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.
Filed May 24, 1982, Ser. No. 381,074
Term of patent 14 years
U.S. Cl. D21—120

279,119
STUFFED TOY BEAR WITH FACE CARICATURE
Steven Yuranyi, 5720 Cavendish Blvd., Apt. 1401, Cote St. Luc, Quebec, Canada
Filed Sep. 27, 1982, Ser. No. 424,634
Term of patent 14 years
U.S. Cl. D21—159

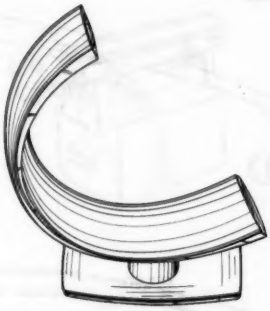
279,120
JOGGING BELT
Mark Spangler, Brooklyn Center, Minn., assignor to Palantir Inc., Brooklyn Center, Minn.
Filed Jan. 13, 1984, Ser. No. 570,696
Term of patent 14 years
U.S. Cl. D21—191

279,121
COMBINED TETHERED GOLF TEES AND BASE THEREFOR
Gordon D. Wampler, 302 Sutton Bridge Rd., Box 701, Gadsden, Ala. 35901
Filed Apr. 1, 1983, Ser. No. 481,485
Term of patent 14 years
U.S. Cl. D21—208



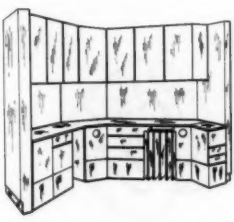
279,122
FISHING ROD HOLDER
Daniel J. Mohel, 1408 Summit Cir., Taylor, Tex. 76574
Filed Jan. 17, 1983, Ser. No. 432,303
Term of patent 14 years
U.S. Cl. D22—13

279,123
BATH SPOUT OR SIMILAR ARTICLE
James E. Niemann, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.
Filed Mar. 7, 1983, Ser. No. 472,797
Term of patent 14 years
U.S. Cl. D23—32

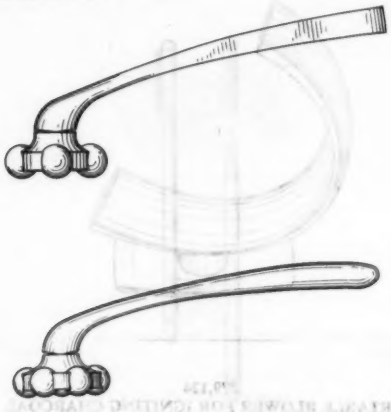


279,124
PORTABLE BLOWER FOR IGNITING CHARCOAL
Philip W. Jensen, and Karl-Heinz Stawski, both of Hood River, Oreg., assignors to P & D, Hood River, Oreg.
Filed Sep. 30, 1982, Ser. No. 429,142
Term of patent 14 years
U.S. Cl. D23—162

279,125
DENTIST SERVICE UNIT
David E. J. Newman, Toronto, Canada, assignor to D.I. Retail Planning & Design Ltd., Toronto, Canada
Filed Aug. 12, 1982, Ser. No. 407,596
Claims priority, application Canada, Apr. 27, 1982, 27-04-82-13
Term of patent 14 years
U.S. Cl. D24—4



279,126
FACIAL MASSAGE INSTRUMENT
Charles Kaeser, Pully, Switzerland, assignor to P.F. Cosmetique, Paris, France
Filed Nov. 29, 1982, Ser. No. 445,151
Claims priority, application France, Jun. 8, 1982, 822000
Term of patent 14 years
U.S. Cl. D24—36

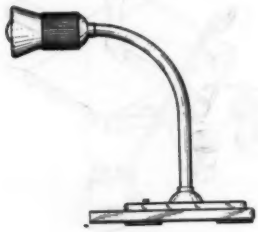


279,127
FLUORESCENT LAMP
Masumi Suzuki, Funabashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Nov. 29, 1982, Ser. No. 445,041
Term of patent 14 years
U.S. Cl. D26—3

279,128
FLUORESCENT LAMP
Masumi Suzuki, Funabashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Nov. 29, 1982, Ser. No. 445,163
Claims priority, application Japan, Nov. 4, 1981, 56-48832
Term of patent 14 years
U.S. Cl. D26—3

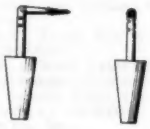
279,129
CANDLE HOLDER
Gary R. Wendt, Fountain Valley, Calif., assignor to Leonard R. Vogel, Steamwood, Ill., a part interest
Filed Apr. 23, 1982, Ser. No. 371,071
Term of patent 14 years
U.S. Cl. D26—9

279,130
LAMP
Robert M. Berger, Warren, Vt., assignor to Intercon Purchasing Industries (USA) Ltd., Forest Hills, N.Y.
Filed Jan. 17, 1983, Ser. No. 458,453
Term of patent 14 years
U.S. Cl. D26—62

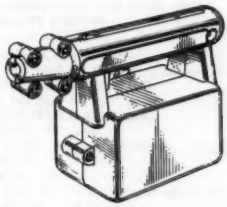


279,131
PERISCOPIC REMOTE ILLUMINATOR
Creed F. McDaris, 518 Marsheutz Ave., Huntsville, Ala. 35801
Filed Apr. 5, 1982, Ser. No. 365,871
Term of patent 14 years
U.S. Cl. D26—37

279,132
ADJUSTABLE COSMETIC APPLICATOR
Henry J. Cassai, 163-47 85 St., Howard Beach, N.Y. 11414, and Gino H. Cassai, 924 E. 96th St., Brooklyn, N.Y. 11236
Filed Aug. 10, 1982, Ser. No. 406,939
Term of patent 14 years
U.S. Cl. D28—7



279,133
HOUSING FOR AN ELECTRICAL PROD
Richard E. Ayres, 32501 Road 228, Woodlake, Calif. 93286
Filed Oct. 17, 1983, Ser. No. 542,890
Term of patent 14 years
U.S. Cl. D30—32



279,134
QUILL CAN
Olin H. Baker, and Robert P. Reilly, both of Madison, Ind., assignors to Meese, Inc., Madison, Ind.
Division of Ser. No. 422,554, Sep. 24, 1982,. This application Dec. 22, 1983, Ser. No. 564,294
Term of patent 14 years
U.S. Cl. D34—43

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF JUNE, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. R. Wilfley and Sons, Inc.: *See*—
Weber, Richard B.; Wilfley, George M.; and Wilfley, George M., 4,521,349, Cl. 261-93.000.

Aaserude, Gordon: *See*—
Mercer, James D.; and Aaserude, Gordon, 4,520,802, Cl. 128-80.00C.

Abbott, Scot D.; and Luddy, Michael A. G., to Du Pont de Nemours, E. I., and Company. Particle reagent size distribution measurements for immunoassay. 4,521,521, Cl. 436-517.000.

Abe, Eiji; and Kanazawa, Junpei, to Shinko Electric Co., Ltd. Guidance conductor for driverless vehicle. 4,520,889, Cl. 180-168.000.

Abe, Masaharu: *See*—
Oizumi, Masayuki; Abe, Masaharu; and Fushiki, Yasuo, 4,521,491, Cl. 428-458.000.

Abe, Michio, to Tokai TRW & Co., Ltd. Method for cutting rack teeth. 4,521,141, Cl. 409-48.000.

Abe, Tadafumi: *See*—
Sakamoto, Takao; and Abe, Tadafumi, 4,521,473, Cl. 428-82.000.

Abner, David K.: *See*—
Jenkins, Richard L.; Pettus, John A.; and Abner, David K., 4,521,225, Cl. 55-18.000.

Abraham, Nicholas F., to World Video Library, Inc. Recorded program communication system. 4,521,806, Cl. 358-86.000.

Adams, L. Jane, to Eastman Kodak Company. Colored polyester compositions. 4,521,556, Cl. 524-88.000.

Adams Rite Products, Inc.: *See*—
Sheffer, Ralph L., 4,520,992, Cl. 251-48.000.

Adell, Robert, to U.S. Product Development Company. Insulated edge guard. 4,520,593, Cl. 49-462.000.

Adell, Robert, to U.S. Product Development Company. Method of making edge guard. 4,520,594, Cl. 49-462.000.

Adorjan, Jon M.; Kobiske, Michael H.; and Astorino, Michael P., to Maremont Corporation. Series spring shock absorbers. 4,521,002, Cl. 267-8.00R.

Adsit, Gordon H., to Orthner, Gordon W. Mixing apparatus with removable drum liner. 4,521,116, Cl. 366-54.000.

Advanced Micro Devices, Inc.: *See*—
Wilson, Stanley, 4,521,699, Cl. 307-456.000.

AGA AB: *See*—
Poulsen, Bo, 4,521,676, Cl. 235-375.000.

Agabekov, Youri. Tubular electric lamp fixture. 4,521,838, Cl. 362-219.000.

Agency of Industrial Science & Technology: *See*—
Miura, Kazunori; Hattori, Yoshinori; and Matsuo, Yasushi, 4,521,358, Cl. 264-65.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Podszun, Wolfgang; Simm, Walter; Goossens, John; and Suling, Carlhans, 4,521,505, Cl. 430-112.000.
Stolzenburg, Rudolf; Bergthaller, Peter; Wolfrum, Gerhard; and Strauss, Jurgen, 4,521,506, Cl. 430-241.000.

Ahlm, Lars, to Timmele Laminering AB. Mattress or pillow construction. 4,520,517, Cl. 5-481.000.

Aichi, Takeo: *See*—
Hayashi, Mitsuji; Endo, Hideo; Oishibashi, Hirotsugu; Aichi, Takeo; and Sasaki, Shigeru, 4,520,756, Cl. 118-699.000.

Aigo, Seiichiro. Cradle for semiconductor element carrier. 4,520,934, Cl. 211-41.000.

Aioi Seiki Kabushiki Kaisha: *See*—
Keitaro, Yonezawa, 4,520,919, Cl. 198-648.000.

Air Products and Chemicals, Inc.: *See*—
Erickson, Donald C., 4,521,398, Cl. 423-579.000.
Hausman, Mary L.; and Lenney, William E., 4,521,561, Cl. 524-459.000.
Pierantozzi, Ronald, 4,521,540, Cl. 518-717.000.
Wells, James E.; and Eskinazi, Victoria, 4,521,600, Cl. 544-352.000.

Ajinomoto Co., Inc.: *See*—
Oyama, Kiyotaka; Irino, Shigeaki; Harada, Tsuneo; and Nakamura, Masao, 4,521,514, Cl. 435-70.000.

Akagiri, Kenzo; and Katakura, Masayuki, to Sony Corporation. Gain control circuit. 4,521,738, Cl. 330-134.000.

Akeroyd, Richard T. Dual fuel valve. 4,520,766, Cl. 123-27.0GE.

AKG Akustische u.Kino-Gerate Gesellschaft m.b.H.: *See*—
Ruberl, Ernst, 4,521,741, Cl. 330-277.000.

Akram, M. Faheem, to Motorola, Inc. Ripple counter circuit having reduced propagation delay. 4,521,898, Cl. 377-116.000.

Aktiebolaget Amals Mekaniska Verkstad: *See*—
Andreasson, Bengt A., 4,520,967, Cl. 242-55.000.

Aktiengesellschaft Adolph Saurer: *See*—
Lucian, Anton; and Geiger, Kurt, 4,520,848, Cl. 139-1.00R.

Akzona Incorporated: *See*—
Seibert, Karl; Neumann, Klaus; Spiess, Ernst; and Bruil, Hendrik G., 4,521,326, Cl. 252-174.210.

Alberta Research Council: *See*—
Kessick, Michael A.; George, Zacharia M.; and Schneider, Linda G., 4,521,382, Cl. 423-68.000.
Kessick, Michael A.; George, Zacharia M.; and Schneider, Linda G., 4,521,383, Cl. 423-68.000.

Albrecht, Charles W.: *See*—
Hicks, Irwin A.; and Albrecht, Charles W., 4,520,676, Cl. 73-281.000.

Albright, Jay D.: *See*—
Dusza, John P.; Tomcufcik, Andrew S.; and Albright, Jay D., 4,521,422, Cl. 514-258.000.

Alig, Franz; Hemmerling, Horst; and Neulinger, Franz, to Metallgesellschaft AG. Method of automatically controlling a dust-collecting plant. 4,521,226, Cl. 55-21.000.

Alig, Franz: *See*—
Daar, Horst; and Alig, Franz, 4,521,223, Cl. 55-13.000.
Daar, Horst; and Alig, Franz, 4,521,228, Cl. 55-105.000.

Allard, Emmanuel M., to Gould Inc. Electrostatic printer of video pictures with grey tones. 4,521,790, Cl. 346-154.000.

Allard, Jules N., to Bush Universal, Inc. Techniques for stiffening shoe insoles. 4,520,522, Cl. 12-40.500.

Allemane, Claude. Folding guard rail for a platform. 4,520,898, Cl. 182-113.000.

Allemano, Emilio. Manometric instrument for underwater diving. 4,520,668, Cl. 73-300.000.

Allen-Bradley Company: *See*—
Galdun, Daniel J.; Grudowski, Raymond A.; and Flood, Mark A., 4,521,871, Cl. 364-900.000.

Allen, James L.: *See*—
Barmatz, Martin B.; Allen, James L.; and Granett, Dan, 4,520,656, Cl. 73-505.000.

Allen, Robert L., to Champion International Corporation. Light refractive coated paperboard. 4,521,492, Cl. 428-464.000.

Alliance Manufacturing Company, Inc., The: *See*—
Meyer, Lawrence L.; and Carli, Alvin J., 4,520,684, Cl. 74-89.210.

Allibert S.A.: *See*—
Deconinck, Didier, 4,521,054, Cl. 297-357.000.

Allied Corporation: *See*—
Gaiser, Robert F., 4,520,911, Cl. 192-13.00A.
Knapp, Anthony W.; and Werth, Dee A., 4,521,064, Cl. 339-45.00M.

Alpaire, Inc.: *See*—
Bohrer, Walter G., Jr.; and Stamps, Kenneth H., 4,520,717, Cl. 99-337.000.

Alsthom Atlantique: *See*—
Thuries, Edmond, 4,521,657, Cl. 200-148.00R.

Althausen, Ferdinand; Proksa, Ferdinand; and Osinski, Ulrich, to Maschinenfabrik Hennecke GmbH. Machinery for filling cavities with flowable reaction mixtures. 4,520,947, Cl. 222-63.000.

Alton, Michael J., to Omni Devices, Inc. Combined static and dynamic image data display system. 4,521,771, Cl. 340-705.000.

Aluminum Company of America: *See*—
Powers, John H.; and Remaley, Edward G., 4,521,463, Cl. 427-435.000.

ALZA Corporation: *See*—
Theeuwes, Felix, 4,521,211, Cl. 604-85.000.

Amana Refrigeration, Inc.: *See*—
Wyland, Alvin D.; Smith, Duaine W.; and Blackburn, Louis W., 4,521,658, Cl. 219-10.55B.

Amasek, Inc.: *See*—
Stewart, E. Allen; and Keesling, Evan L., 4,520,616, Cl. 56-9.000.

Amazonen-Werke H. Dreyer: *See*—
Grosse-Scharmann, Franz, 4,520,874, Cl. 172-49.500.

AMB Systems Corp.: *See*—
Silman, Robert E., 4,521,512, Cl. 435-35.000.

American Cyanamid Company: *See*—
Cortese, Nicholas A., Jr.; and Gastrock, William H., 4,521,629, Cl. 568-313.000.
Dusza, John P.; Tomcufcik, Andrew S.; and Albright, Jay D., 4,521,422, Cl. 514-258.000.
Kohli, Dalip K., 4,521,583, Cl. 528-119.000.
Lucas, Howard R., 4,521,563, Cl. 524-555.000.

American Dental Association Health Foundation: *See*—
Bowen, Rafael L., 4,521,550, Cl. 523-116.000.

American Flange & Manufacturing Co. Inc.: *See*—
Dwinell, Davis B., 4,520,942, Cl. 220-257.000.

American Hoechst Corporation: *See*—
Weis, Robert, 4,521,214, Cl. 8-506.000.

American Home Products Corp.: *See*—
Asselin, Andre A.; Crosilla, Danilo A.; and Humber, Leslie G., 4,521,606, Cl. 548-503.000.

American Home Products Corporation (Del.): *See—*
Flanagan, Eugene L., III, 4,520,830, Cl. 128-660.000.
American Hospital Supply Corporation: *See—*
Swaniger, James R.; and Goth, Paul R., 4,520,824, Cl. 128-395.000.
American Microsystems, Incorporated: *See—*
Amir, Gideon; and Gregorian, Roubik, 4,521,907, Cl. 381-47.000.
Amir, Gideon; and Gregorian, Roubik, to American Microsystems, Incorporated. Multiplier/adder circuit. 4,521,907, Cl. 381-47.000.
AMP Incorporated: *See—*
Bunnell, Edward D., 4,520,558, Cl. 29-749.000.
Ampex Corporation: *See—*
Babbel, John H.; Russell, William A.; and Steele, Robert B., 4,521,870, Cl. 364-900.000.
Kudelski, Stefan; and Rosselet, Ernest, 4,521,706, Cl. 310-67.00R.
Ryan, John O., 4,521,736, Cl. 329-102.000.
Analog Devices Incorporated: *See—*
Burton, David P., 4,521,764, Cl. 340-347.0DA.
Anami, Kenji: *See—*
Shinohara, Hirofumi; Tomisawa, Osamu; Anami, Kenji; and Yoshimoto, Masahiko, 4,521,704, Cl. 307-530.000.
Anderson-Cook, Inc.: *See—*
Killop, James T., 4,520,540, Cl. 29-90.00B.
Anderson, Edward M. Apparatus and method for separating a mixture of three liquids. 4,521,312, Cl. 210-744.000.
Anderson, Eric G., to Rockwell International Corporation. Data input module. 4,521,679, Cl. 235-492.000.
Anderson, James J., to Mobil Oil Corporation. Highly flame resistant rigid urethane-isocyanurate foam compositions. 4,521,547, Cl. 521-137.000.
Anderson, Patricia A.; Hagens, Roger G.; and Roden, Dianne M., to Diversey Wyandotte Inc. Conveyor track lubricant composition employing phosphate esters and method of using same. 4,521,321, Cl. 252-49.300.
Anderson, Ronald L.; and Mascio, Maria R. Cleaning contact lenses with solution of bromelain and carboxypeptidase. 4,521,254, Cl. 134-26.000.
Anderson, Steven. Seed planter attachment for chisel plow. 4,520,742, Cl. 111-86.000.
Ando, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. System for focusing a light beam on a light reflecting surface. 4,521,680, Cl. 250-201.000.
Andoh, Naoki; and Fujiwara, Shuetsu, to Japan Synthetic Rubber Co., Ltd. Process for producing aromatic amine. 4,521,622, Cl. 564-406.000.
Andreasson, Bengt A., to Aktiebolaget Amals Mekaniska Verkstad. Device for a roll spindle. 4,520,967, Cl. 242-55.000.
Andres, Rudolf; Grantz, Helmut; Munzel, Wolf-Dietrich; and Odebrecht, Wolfgang, to Daimler-Benz Aktiengesellschaft. Heat-exchanger with a bundle of parallelly extending pipes adapted to be acted upon by air. 4,520,863, Cl. 165-48.00R.
Andrews, Gary W.: *See—*
Dix, Robert M.; Ellis, Timothy A.; and Andrews, Gary W., 4,520,629, Cl. 62-6.000.
Anger, Anton, to Osterreichische Schiffswerften Aktiengellschaft Linz-Korneuburg. Apparatus for producing undercut tubular synthetic plastic articles. 4,521,178, Cl. 425-548.000.
Angevine, Philip J.; Kuhl, Gunter H.; and Mizrahi, Sadi, to Mobil Oil Corporation. Catalytic conversion of shale oil. 4,521,297, Cl. 208-89.000.
Aono, Kiyotaka: *See—*
Ishida, Tokuzi; and Aono, Kiyotaka, 4,520,776, Cl. 123-308.000.
Aotsuka, Yasuo: *See—*
Ohtsuka, Shuichi; Aotsuka, Yasuo; and Saito, Eiichi, 4,521,103, Cl. 355-14.00D.
Aoyagi, Yukio: *See—*
Nakajima, Kichio; Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; and Honma, Kazuo, 4,520,626, Cl. 60-468.000.
Aoyama, Tetsuo: *See—*
Kida, Koichi; Aoyama, Tetsuo; and Uchiyama, Takako, 4,521,638, Cl. 585-640.000.
Appleman, William S.; and Sturgill, James D., to RPC Corporation. Twistlock operator. 4,521,044, Cl. 294-82.240.
Arai, Mitsuru: *See—*
Sato, Hideyori; Inaba, Nobuaki; Arai, Mitsuru; and Onzou, Michio, 4,520,625, Cl. 60-464.000.
Arai, Yoshihiro; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,521,482, Cl. 428-336.000.
Archer, Gene R. Gardening tool. 4,520,621, Cl. 56-400.110.
Arends, Charles B.: *See—*
Bubeck, Robert A.; and Arends, Charles B., 4,521,569, Cl. 525-316.000.
Arfsten, Richard. Roof ventilator. 4,520,713, Cl. 98-42.190.
Arikawa, Yoshijiro: *See—*
Nishimura, Yasuyuki; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Kuwahara, Takanori; and Tanimoto, Hirotoshi, 4,521,631, Cl. 568-478.000.
Armbrust, Herbert; Dix, Johannes P.; Hansen, Guenter; and Zeidler, Georg, to BASF Aktiengesellschaft. Disazo dyes. 4,521,216, Cl. 8-639.000.
Armstrong, James A. Building wall descent device having manually operated brake means. 4,520,895, Cl. 182-3.000.
Armstrong World Industries, Inc.: *See—*
Kauffman, William J.; and Martin, Pamela H., 4,521,215, Cl. 8-508.000.
Arndt, Peter J.; Ludwig, Walter; Munzer, Manfred; Siol, Werner; and Wenzel, Franz, to Rohm GmbH. Method for making impact resistant molding compositions. 4,521,567, Cl. 525-261.000.
Arnold, Anthony F.; and Schmeckenbecher, Arnold F., to International Business Machines Corporation. Process for forming a high density metallurgy system on a substrate and structure thereof. 4,521,449, Cl. 427-96.000.
Arnold, Gerald D., to John Thurley Limited. Direct contact water heater. 4,520,761, Cl. 122-31.00R.
Arnold, William; and Brouwer, Gerardus J., to Brouwer Turf Equipment Limited. Forklift vehicle. 4,520,903, Cl. 187-9.00R.
Arnould, Jacques; and Tonnel, Eugene, to Thomson-CSF. Semiconductor device with deep grip accessible via the surface and process for manufacturing same. 4,520,552, Cl. 29-571.000.
Arntz, Dietrich; Prescher, Gunter; Burkhardt, Werner; Heilos, Johannes; and Manner, Reinhard, to Degussa Aktiengesellschaft. Process for preparing acrylic or methacrylic acid. 4,521,618, Cl. 562-535.000.
Arthur K. Thatcher Revokable Trust: *See—*
Thatcher, Arthur K.; and McCarter, Ed R., deceased, 4,520,786, Cl. 123-536.000.
Arwin, Hans R.: *See—*
Lundstrom, Kurt I.; Arwin, Hans R.; Rieke, Erwin; Sielaff, Gunter; and Hennrich, Norbert, 4,521,522, Cl. 436-525.000.
Asahi Glass Company, Ltd.: *See—*
Nakaya, Keiichi; and Sato, Kunio, 4,521,397, Cl. 423-474.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Hattori, Yoshihiro; Watanabe, Takashi; and Maeda, Kunio, 4,521,488, Cl. 428-409.000.
Kabashima, Kazuo; and Tanaka, Kyugo, 4,521,793, Cl. 346-201.000.
Mori, Kyoichiro; and Hirano, Hiroyuki, 4,521,568, Cl. 525-309.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Takami, Satoshi; and Kuroki, Yoshifumi, 4,521,094, Cl. 354-423.000.
Asai, Mitsuko: *See—*
Kanamaru, Tsuneo; Shinagawa, Susumu; and Asai, Mitsuko, 4,521,432, Cl. 514-556.000.
Asai, Shinichiro; Katoh, Kazuo; and Nakano, Tatsuo, to Denki Kagaku Kogyo Kabushiki Kaisha. Hybrid integrated circuit and preparation thereof. 4,521,476, Cl. 428-209.000.
Asami, Masahiro: *See—*
Toaba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, 4,521,565, Cl. 525-64.000.
ASARCO Incorporated: *See—*
Di Martini, Carl R.; Howe, Herbert E.; Scott, William L.; and Bulvanoski, Leo J., 4,521,247, Cl. 75-77.000.
ASEA Aktiebolag: *See—*
Bjorklund, Robert; Gustavsson, Hans; Lundstrom, Ingemar; and Nygren, Bertil, 4,521,450, Cl. 427-121.000.
Lindberg, Per-Olof, 4,520,597, Cl. 51-134.50R.
Ashland Oil, Inc.: *See—*
Mansour, Maher L., 4,520,750, Cl. 118-58.000.
Aspen Laboratories, Inc.: *See—*
Birmingham, Michael J.; and Manes, Michael R., 4,520,819, Cl. 128-327.000.
Kitchin, Dwight W.; and Manes, Michael R., 4,520,820, Cl. 128-327.000.
Asselin, Andre A.; and Humber, Leslie G., to Ayerst, McKenna & Harrison, Ltd. 7,8,9,10-Tetrahydrobenzo[h]quinolin-9-amine derivatives and compositions and methods for treating depression employing them. 4,521,423, Cl. 514-290.000.
Asselin, Andre A.; Crosilla, Danilo A.; and Humber, Leslie G., to American Home Products Corp. 5-Indolyl substituted aminoethanols. 4,521,606, Cl. 548-503.000.
Asselin, Andre A.: *See—*
Gauthier, Jean A.; Voith, Katherine; and Asselin, Andre A., 4,521,534, Cl. 514-219.000.
Astorino, Michael P.: *See—*
Adorjan, Jon M.; Kobiske, Michael H.; and Astorino, Michael P., 4,521,002, Cl. 267-8.00R.
Astrom, Erik G.: *See—*
Borup, Alf L.; and Astrom, Erik G., 4,520,901, Cl. 184-3.100.
AT&T Bell Laboratories: *See—*
Carlson, Eric R.; and Schneider, Martin V., 4,521,755, Cl. 333-244.000.
Dollard, Peter M.; and Turin, William, 4,521,886, Cl. 371-43.000.
Orsic, Milo, 4,521,880, Cl. 370-68.000.
Peterson, William A., 4,521,739, Cl. 330-257.000.
Reichmanis, Elsa; and Wilkins, Cletus W., Jr., 4,521,274, Cl. 156-643.000.
AT&T Technologies, Inc.: *See—*
Fanning, William J., 4,521,828, Cl. 361-386.000.
Gault, William A., 4,521,272, Cl. 156-616.00R.
Atherton, James H.; and Stanojevic, Silvo, to Honeywell Inc. Hall effect circuit with temperature compensation. 4,521,727, Cl. 323-294.000.
Atlantic Richfield Company: *See—*
Kriel, Wayne A., 4,521,636, Cl. 568-659.000.
Stevens, Frank, 4,521,635, Cl. 568-659.000.
Stevens, Frank, 4,521,637, Cl. 568-659.000.
Aubourg, Patrick F.; and Fabricant, Barbara L., to Owens-Corning Fiberglas Corporation. Methods of introducing fluorine into glasses. 4,521,523, Cl. 501-30.000.
Aultman, William H.; and Reese, Morris T., to Sangamo Weston, Inc. Low leakage capacitor header and manufacturing method therefor. 4,521,830, Cl. 361-433.000.

Austenal International, Inc.: *See*—
Ehrnford, Lars E. M., 4,521,191, Cl. 433-164.000.

Automated Robotic Systems, Inc.: *See*—
Dunn, Jimmy L.; Mayo, George L.; and Romeo, Frank C., 4,520,550, Cl. 29-568.000.

Avimage, Inc.: *See*—
Reynolds, Collins J., III, 4,521,857, Cl. 364-439.000.

Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; Koumura, Noboru; and Kazuma, Koji, to Canon Kabushiki Kaisha. Printing apparatus or system. 4,521,805, Cl. 358-75.000.

Ayerst, McKenna & Harrison, Ltd.: *See*—
Asselin, Andre A.; and Humber, Leslie G., 4,521,423, Cl. 514-290.000.
Gauthier, Jean A.; Voith, Katherine; and Asselin, Andre A., 4,521,534, Cl. 514-219.000.

Aykut, Eva-Marie, executor: *See*—
Aykut, Kurt, deceased; Aykut, Eva-Marie, executor; and Wolf, Wolfram, 4,520,614, Cl. 53-540.000.

Aykut, Kurt, deceased; by Aykut, Eva-Marie, executor; and Wolf, Wolfram. Apparatus for introducing stacks of paper sheets or the like into cartons. 4,520,614, Cl. 53-540.000.

Azuma, Yoshifumi: *See*—
Mukae, Toshiyuki; and Azuma, Yoshifumi, 4,521,105, Cl. 355-64.000.

Azumi, Toshinori: *See*—
Norota, Susumi; Kiriyama, Tsutomu; Imoto, Tadashi; and Azumi, Toshinori, 4,521,364, Cl. 264-176.00F.

B.F. Goodrich Company, The: *See*—
Fisher, John M.; and Putt, James C., 4,520,838, Cl. 137-69.000.

Babbel, John H.; Russell, William A.; and Steele, Robert B., to Ampex Corporation. Audio/video system having touch responsive function display screen. 4,521,870, Cl. 364-900.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Nishimura, Yasuyuki; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Kuwahara, Takanori; and Tanimoto, Hirotoshi, 4,521,631, Cl. 568-478.000.

Babcock & Wilcox Company, The: *See*—
Bohl, Thomas L.; and Ciammaichella, Richard C., 4,521,089, Cl. 350-582.000.
Moss, William H.; and Scheib, Thomas J., 4,521,869, Cl. 364-900.000.

Bachi, Inc.: *See*—
Bachi, Robert W.; and Bachi, Phillip L., 4,520,944, Cl. 220-305.000.

Bachi, Phillip L.: *See*—
Bachi, Robert W.; and Bachi, Phillip L., 4,520,944, Cl. 220-305.000.

Bachi, Robert W.; and Bachi, Phillip L., to Bachi, Inc. Open-ended container closure. 4,520,944, Cl. 220-305.000.

Baeger, Holm, to VDO Adolf Schindling AG. Electro-optical display without reflection. 4,521,078, Cl. 350-334.000.

Baglioni, Alessandro, to Medosan Industrie Biochimiche Riunite S.p.A. Ester of the 1-methyl-5-p-toluoylpyrrole-2-acetic acid having antiinflammatory, mucolytic and antitussive properties, process for its preparation and pharmaceutical compositions containing them. 4,521,538, Cl. 514-423.000.

Bahrle, Dieter K.; and Schwerdt, Friedrich W., to International Business Machines Corporation. Method of making printed circuits with one conductor plane. 4,521,280, Cl. 204-15.000.

Bain, Lee L., to Xerox Corporation. Programmable driver/controller for ink jet printheads. 4,521,786, Cl. 346-140.00R.

Baker, Don R.; and Tam, Teresa M., to Stauffer Chemical Company. N-Carbonyl-N-(4-substituted benzyl)-4-chloroanilines. 4,521,243, Cl. 71-100.000.

Baker, George E.: *See*—
Ziehm, Richard T.; Wilczek, Stephen P.; Baker, George E.; Husted, Raymond R.; Dumas, Glen A.; Bunker, Keith G.; and Place, George H., Jr., 4,521,847, Cl. 364-184.000.

Baker, Ian M., to U.S. Philips Corporation. Infra-red radiation imaging devices and methods for their manufacture. 4,521,798, Cl. 357-30.000.

Baker International Corp.: *See*—
Herron, Charles R., 4,520,734, Cl. 105-157.00R.

Baker, Irwin G., to Boeing Company, The. Triple redundant electromechanical linear actuator and method. 4,521,707, Cl. 310-80.000.

Baker, Nathaniel R.: *See*—
Lynch, Franklin E.; and Baker, Nathaniel R., 4,520,763, Cl. 123-1.00A.

Baker, Robert D.; Driggers, Gerald W.; Gray, Ronald W.; and Hawkins, Lawrence A., to Combustion Engineering, Inc. Tubular discharge electrode for electrostatic precipitator. 4,521,229, Cl. 55-137.000.

Baker, William; Smith, Gordon H.; Beach, Xio I.; Sallee, Gary F.; and Stein, Jeffrey I., to Masco Corporation of Indiana. Processor controlled, scanning radio receiver having tabular storage of service band frequency codes. 4,521,915, Cl. 455-165.000.

Bako, Lazlo, to Presto Lock, Inc. Combination lock with security feature. 4,520,641, Cl. 70-312.000.

Balcke-Duerr AG: *See*—
Fickelscher, Kurt G., 4,521,158, Cl. 416-160.000.

Ban, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Variable capacity flywheel. 4,520,688, Cl. 74-572.000.

Baquet, Philippe: *See*—
Rouly, Eric; Baquet, Philippe; and Dubuit, Jean-Louis, 4,520,726, Cl. 101-123.000.

Barabas, Eugene S., to GAF Corporation. Rust removal process. 4,521,253, Cl. 134-3.000.

Barbour, Bruce E. Wrist strap illuminating device. 4,521,832, Cl. 362-103.000.

Barmatz, Martin B.; Allen, James L.; and Granett, Dan, to United States of America, National Aeronautics and Space Administration. Gravity enhanced acoustic levitation method and apparatus. 4,520,656, Cl. 73-505.000.

Baron, Burl E.: *See*—
Blackburn, Jan W.; and Baron, Burl E., 4,521,042, Cl. 285-334.000.

Baron, Walter J., to Water Services of America, Inc. Fluid flow diverter disc valve. 4,520,847, Cl. 137-625.430.

Barrett, Monroe C.: *See*—
Fachini, Robert M.; Barrett, Monroe C.; and McClure, Maxwell D., III, 4,520,617, Cl. 56-16.600.

Barrett, Timothy M. Pistol magazine loading guide. 4,520,585; Cl. 42-7.000.

Bartels, James I., to Honeywell Inc. Reliable field-effect transistor timer circuit. 4,521,705, Cl. 307-605.000.

Barth, Walter: *See*—
Kremser, Harald H.; and Barth, Walter, 4,520,548, Cl. 29-517.000.

Barthel, Richard C.; and Roy, Richard D., to Singer Company, The. Appliance controller. 4,521,722, Cl. 318-578.000.

Barton, George D., Sr. Vehicle anchoring stand. 4,520,649, Cl. 72-457.000.

BASF Aktiengesellschaft: *See*—
Armbrust, Herbert; Dix, Johannes P.; Hansen, Guenter; and Zeidler, Georg, 4,521,216, Cl. 8-639.000.
Broecker, Franz J.; Gettert, Hans; and Kaempfer, Knut, 4,521,387, Cl. 423-210.000.
Fischer, Rolf; Weitz, Hans-Martin; and Paust, Joachim, 4,521,342, Cl. 260-410.000.
Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Ohlinger, Manfred; Wilfinger, Hans J.; Pfannebecker, Emil; and Duffner, Paul, 4,521,527, Cl. 502-184.000.
Meyer, Norbert; Zeeh, Bernd; Buschmann, Ernst; and Pommer, Ernst-Heinrich, 4,521,429, Cl. 514-383.000.
Plath, Peter; Rohr, Wolfgang; Schwendemann, Volker; and Wuerzer, Bruno, 4,521,604, Cl. 548-301.000.
Rebafka, Walter; Heilen, Gerd; Halbritter, Klaus; and Franzischka, Wolfgang, 4,521,602, Cl. 546-184.000.
Wickenhaeuser, Gerhard; Heida, Bernd; Graf, Fritz; and Hupfer, Leopold, 4,521,632, Cl. 568-492.000.

BASF Farben & Fasern AG: *See*—
Blum, Rainer; Seitz, Max; and Kaczinski, Friedrich, 4,521,555, Cl. 524-63.000.

Batchelor, William H., to Propane Carburetion Systems, Inc. Gaseous fuel supply and control system for an internal combustion engine. 4,520,785, Cl. 123-525.000.

Battelle Memorial Institute: *See*—
Fiorentino, Robert J., 4,521,360, Cl. 264-108.000.

Bauer, Rainer: *See*—
Muller, Thomas; and Bauer, Rainer, 4,520,673, Cl. 73-623.000.

Bauman, Dale E., to Cornell Research Foundation, Inc. Use of growth hormone to enhance ruminant mammary development. 4,521,409, Cl. 514-21.000.

Baus, Heinz G. Structural assembly for shower partition or the like. 4,520,608, Cl. 52-718.000.

Baxter Travenol Laboratories, Inc.: *See*—
Mason, Joe; and Eckert, Hermann F., 4,521,366, Cl. 264-312.000.
Ruschke, Rick R., 4,521,212, Cl. 604-126.000.
White, Leonard A., 4,521,466, Cl. 428-35.000.

Bayer Aktiengesellschaft: *See*—
Beck, Ulrich; Stohr, Frank-Michael; and Nickel, Horst, 4,521,217, Cl. 8-639.000.
Goyert, Wilhelm; and Winkler, Jurgen, 4,521,582, Cl. 528-67.000.
Grogler, Gerhard; and Kopp, Richard, 4,521,338, Cl. 260-239.00A.
Heitz, Walter; and Risse, Wilhelm, 4,521,584, Cl. 528-214.000.
Kerimis, Dimitrios; Hombach, Rudolf; Muller, Peter; and Dollhausen, Manfred, 4,521,545, Cl. 521-107.000.
Krock, Friedrich W.; and Neoff, Rutger, 4,521,341, Cl. 260-371.000.
Maurer, Fritz; Brandes, Wilhelm; Kuck, Karl-Heinz; Reinecke, Paul; and Scheinpflug, Hans, 4,521,420, Cl. 514-259.000.
Musch, Rudiger; Gobel, Wilhelm; Konter, Wolfgang; and Nolte, Wilfried, 4,521,576, Cl. 526-213.000.
Roos, Ernst; and Kircher, Klaus, 4,521,542, Cl. 521-89.000.
Schmitt, Hans-Georg; Reinecke, Paul; Paulus, Wilfried; Genth, Hermann; and Radt, Walter, 4,521,412, Cl. 514-244.000.
Schroer, Walter; and Wlasitsch, Gyula, 4,521,465, Cl. 428-35.000.

Beach, Edward B. Container for flat articles. 4,520,922, Cl. 206-44.00R.

Beach, Verlin R.: *See*—
Cole, Clinton W.; and Beach, Verlin R., 4,520,837, Cl. 137-68.00R.

Beach, Xio I.: *See*—
Baker, William; Smith, Gordon H.; Beach, Xio I.; Sallee, Gary F.; and Stein, Jeffrey I., 4,521,915, Cl. 455-165.000.

Beachey, Edwin H., to University of Tennesse Research Corporation, The. Synthetic polypeptide fragments. 4,521,334, Cl. 260-112.50R.

Bean, Jackie E.: *See*—
Fischer, Larry E.; and Bean, Jackie E., 4,521,370, Cl. 376-233.000.

Beane, Bennie J., to General Electric Company. Rotary calcining system with cleaning means. 4,521,379, Cl. 422-209.000.

Beard, Jerome C.: *See*—
Borsuk, Gerald M.; Chesson, Edwin E.; Beard, Jerome C.; and Lisle, Thomas K., Jr., 4,521,896, Cl. 377-60.000.

Beatenbough, Paul K.: *See*—
Sacca, Demetrio B.; Sanderson, Edward H.; and Beatenbough, Paul K., 4,520,867, Cl. 165-144.000.

Beatrice Foods Co.: *See*—
Jones, John H.; and Schoenleber, Donald W., 4,520,958, Cl. 229-72.000.

Beck, Ulrich; Stohr, Frank-Michael; and Nickel, Horst, to Bayer Aktiengesellschaft. Phthalocyanine and azo dyestuff mixtures and their use for dyeing paper. 4,521,217, Cl. 8-639.000.

Bednorz, Johannes G.; Hollis, Ralph L., Jr.; Lanz, Martin; Pohl, Wolfgang D.; and Yeack-Scranton, Celia E., to International Business Machines Corporation. Piezoelectric x-y-positioner. 4,520,570, Cl. 33-180.00R.

Beecham Group p.l.c.: *See*—
Southgate, Robert; and Brown, Pamela, 4,521,337, Cl. 534-560.000.

Belart, Juan; Burgdorf, Jochen; Weise, Lutz; Kircher, Dieter; and Goossens, Andre F. L., to ITT Industries, Inc. Hydraulic brake system with slip control. 4,521,061, Cl. 303-114.000.

Bellman, Brian M., to United States of America, Air Force. Clock distribution circuit for active aperture antenna array. 4,521,893, Cl. 375-107.000.

Beloit Corporation: *See*—
Olshansky, Alexis; and Guild, Gerald A., 4,520,704, Cl. 83-499.000.

Belouet, Christian, to Compagnie General d'Electricite; and Societe Nationale Elf Aquitaine. Device for depositing a layer of polycrystalline silicon on a carbon tape. 4,520,752, Cl. 118-405.000.

Bendall, Max R.: *See*—
Pegg, David T.; Doddrell, David M.; and Bendall, Max R., 4,521,732, Cl. 324-300.000.

Bendell, Sidney L., to RCA Corporation. Solid-state color TV camera image size control. 4,521,804, Cl. 358-51.000.

Benedetto, Enrico: *See*—
De Witt, Paolo; and Benedetto, Enrico, 4,521,285, Cl. 204-72.000.

Bengtsson, Bengt L.; Palmlin, Peter; and Saldert, Bertil K., to Nestec, S.A. Blanching process. 4,521,439, Cl. 426-509.000.

Benin, Joshua; Delp, Helen R.; and Krauss, Leland L., to Du Pont de Nemours, E. I., and Company. Automatic splicing device and process. 4,521,263, Cl. 156-159.000.

Benkovic, Stephen J.; Putney, Scott D.; and Schimmel, Paul R., to Research Corporation. Method for degrading DNA. 4,521,509, Cl. 435-6.000.

Berezowsky, John W. Paper sheet holders. 4,521,035, Cl. 281-48.000.

Berge, Christian: *See*—
Cordier, Bernard; and Berge, Christian, 4,520,665, Cl. 73-155.000.

Berger, Kenneth R., to Frito-Lay, Inc. Ultrasonically-sealable peelable seal. 4,521,467, Cl. 428-35.000.

Bergthaller, Peter: *See*—
Stolzenburg, Rudolf; Bergthaller, Peter; Wolfrum, Gerhard; and Strauss, Jurgen, 4,521,506, Cl. 430-241.000.

Bergwerksverband GmbH: *See*—
Richter, Ekkehard; Korbacher, Werner; Knoblauch, Karl; and Giessler, Klaus, 4,521,221, Cl. 48-196.00R.

Berman, Edward. Carrier and method for providing yarn for latch hook rug kits and the like. 4,521,474, Cl. 428-93.000.

Bernard, Samuel, Jr., to Minnesota Mining and Manufacturing Company. Method of establishing communication. 4,521,644, Cl. 179-2.0DP.

Bethurum, Gary C.: *See*—
Kurbikoff, Peter A.; and Bethurum, Gary C., 4,521,062, Cl. 339-14.00R.

Bette, Willi: *See*—
Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, 4,521,889, Cl. 372-87.000.

Biba, Kenneth J.; and Picazo, Jose J., Jr., to Sytek, Incorporated. Multiple channel data communication system. 4,521,891, Cl. 375-8.000.

Bieler, Hans. Cutting or drilling apparatus. 4,521,145, Cl. 409-218.000.

Bigelow, James H.: *See*—
Hastings, Jerome K.; Bigelow, James H.; and Pearson, Robert L., 4,521,757, Cl. 335-79.000.

Bigot, Jean: *See*—
Goursat, Albert-Gilbert; Vernet, Gilles; Rimbert, Jean-Francis; Foulard, Jean; Darle, Thierry; and Bigot, Jean, 4,521,244, Cl. 75-0.50B.

Bilik, Charles W.: *See*—
Olsen, Ole B.; Bilik, Charles W.; Johnson, Herbert H.; and Jozepaitis, Charles M., 4,521,161, Cl. 417-68.000.

Bilofsky, Ruth C.: *See*—
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,521,588, Cl. 528-363.000.

Bingham, Joseph P.; and Hatch, Douglas J., to North American Philips Corporation. Method and apparatus for controlling access to selected television programs. 4,521,809, Cl. 358-120.000.

Binks Manufacturing Company: *See*—
Gerdes, Donald F.; and Telchuk, Steve E., 4,521,227, Cl. 55-225.000.

Bio Research Inc.: *See*—
Kurtz, Leonard D., 4,521,365, Cl. 264-306.000.

Biocon, Inc.: *See*—
Yount, Gary L., 4,521,304, Cl. 210-96.100.

Bipel Limited: *See*—
Gilbert, Barrie W., 4,521,172, Cl. 425-73.000.

Bird, Bertram: *See*—
Fitzgerald-Smith, James P.; Bird, Bertram; and Willis, Michael, 4,520,523, Cl. 14-2.400.

Birmingham, Michael J.; and Manes, Michael R., to Aspen Laboratories, Inc. Tourniquet with differential pressure occlusion detector. 4,520,819, Cl. 128-327.000.

Birsa, Joseph J.: *See*—
Sturges, Robert H., Jr.; Birsa, Joseph J.; Dawson, Paul H.; and Byford, Roger G., 4,521,844, Cl. 364-167.000.

Bizzell, Gary D., to Lockheed Missiles & Space Company, Inc. Gas-tolerant arterial heat pipe. 4,520,865, Cl. 165-104.260.

Bjorklund, Robert; Gustavsson, Hans; Lundstrom, Ingemar; and Nygren, Bertil, to ASEA Aktiebolag. Method of increasing the electrical conductivity of cellulose-based materials or other impregnable materials. 4,521,450, Cl. 427-121.000.

Black & Decker, Inc.: *See*—
Crawford, John G., 4,520,567, Cl. 30-424.000.

Blackburn, Jan W.; and Baron, Burl E., to Hydril Company. Threaded connection. 4,521,042, Cl. 285-334.000.

Blackburn, Louis W.: *See*—
Wyland, Alvin D.; Smith, Duaine W.; and Blackburn, Louis W., 4,521,658, Cl. 219-10.55B.

Blackhurst, William R., to Northrop Corporation. Air-bag ejection system for store deployment. 4,520,975, Cl. 244-137.00R.

Blank, Michael G.; and Hammerschmidt, Horst E., to Maschinenfabrik Koppern FmbH & Co. KG. Multiple injection moulding apparatus. 4,521,177, Cl. 425-533.000.

Blank, Richard W.; and Simard, Albert J., to United States of America, Agriculture. Forest fire rate of spread with timers method. 4,521,120, Cl. 374-102.000.

Blanton, William A., Jr.; and Dimpel, William L., to Chevron Research Company. Process of controlling NO_x in FCC flue gas in which an SO_2 oxidation promotor is used. 4,521,389, Cl. 423-235.000.

Bleistiftmaschinenfabrik Dipl. Ing. Karl Zuber GmbH & Co. KG: *See*—
Kremser, Harald H.; and Barth, Walter, 4,520,548, Cl. 29-517.000.

Blessmann, Heinz: *See*—
Weber, Klaus; Willert, Manfred; and Blessmann, Heinz, 4,521,076, Cl. 350-254.000.

Bloch, Joseph T.; and Cross, Dan A., to Boeing Company, The. Wire canister for a robotic wire harness assembly system. 4,520,966, Cl. 242-54.00R.

Block Drug Company, Inc.: *See*—
Chang, Tiang-Shing; and Zientek, Lucy J., 4,521,551, Cl. 523-120.000.

Block, Michael J.: *See*—
Kelley, Arnold E.; Block, Michael J.; and Skripek, Milan R., 4,521,278, Cl. 201-17.000.

Blum, Rainer; Seitz, Max; and Kaczinski, Friedrich, to BASF Farben & Fasern AG. Plastisols having carbon dust fillers. 4,521,555, Cl. 524-63.000.

Blumberg, Richard J.; Brenner, Stewart; and Robortaccio, Rocco J., to International Business Machines Corporation. TTL logic circuit employing feedback to improved the speed-power curve. 4,521,700, Cl. 307-456.000.

Blumenthal, Lawrence S., to Gelhaar Uniform Company. Playing field boundary flag and support therefor. 4,520,985, Cl. 248-530.000.

Bock, Jan: *See*—
Turner, S. Richard; Siano, Donald B.; and Bock, Jan, 4,521,580, Cl. 526-307.200.

Boden, Richard M.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,521,634, Cl. 568-665.000.

Bodette, James E.: *See*—
Hilker, G. Daniel; Lausen, Verne H.; Coon, Jessie H.; Bodette, James E.; Grimes, Jerry L.; Wright, Roger D.; Disque, Donny R.; and Bultemeier, Keith D., 4,521,173, Cl. 425-113.000.

Boehmer, Georg, to Siemens Aktiengesellschaft. Method and apparatus for the representation of characters. 4,521,123, Cl. 400-124.000.

Boehringer Mannheim GmbH: *See*—
Draeger, Brigitte; and Ziegenhorn, Joachim, 4,521,519, Cl. 436-17.000.

Boeing Company, The: *See*—
Baker, Irwin G., 4,521,707, Cl. 310-80.000.
Bloch, Joseph T.; and Cross, Dan A., 4,520,966, Cl. 242-54.00R.
Engelke, Claude W.; Sutton, Gerald E.; and Potter, Steven E., 4,521,354, Cl. 264-46.600.
Miller, Glen E., 4,521,683, Cl. 250-221.000.
Pinson, George T., 4,521,782, Cl. 343-765.000.

Bohl, Thomas L.; and Ciammaichella, Richard C., to Babcock & Wilcox Company, The. Optical window purge arrangement. 4,521,089, Cl. 350-582.000.

Bohm, Heinz, to U.S. Philips Corporation. Graded index rod lens comprising light-wave conductors. 4,521,071, Cl. 350-96.180.

Bohrer, Walter G., Jr.; and Stamps, Kenneth H., to Alpaire, Inc. Food frying apparatus. 4,520,717, Cl. 99-337.000.

Bok, Edward. Apparatus for deposition of fluid and gaseous media on substrates. 4,521,268, Cl. 156-345.000.

Bommarito, John J.: *See*—
Ryntz, Edward F., Jr.; and Bommarito, John J., 4,520,858, Cl. 164-34.000.

Bonne, Harry: *See*—
Hampel, Hans-Joachim; Scondo, Ludwig; Stahl, Jurgen; Wegner, Wilhelm; and Bonne, Harry, 4,520,948, Cl. 222-103.000.

Bonnot, Guy; Laviolette, Pierre; Potiron, Andre; and Deysson, Jean-Yves, to Institut National de la Recherche Agronomique. Process for producing encapsulable globules. 4,521,353, Cl. 264-8.000.

Bordet, Rene , to Electricite de France (Service National). Stacks or vertical pipes for the flow of gas. 4,520,600, Cl. 52-83.000.

Borg-Warner Corporation: *See*—
Ferris, Ernest A.; and McColl, John W., 4,520,912, Cl. 192-85.0AA.
Hoadley, Frederick L., 4,521,840, Cl. 363-35.000.

Borjesson, Per O.: *See*—
Salomonsson, Goran; Borjesson, Per O.; Mandersson, Bengt; Holmer, Nils-Gunnar; and Lindstrom, Kjell, 4,520,670, Cl. 73-602.000.

Bormioli, Pier L., to Vetreria Padana Polesana, S.p.A. Glass storage jar. 4,520,937, Cl. 215-10.000.

Borsa, Andrew J.: *See*—
Stapleford, Gary N.; and Borsa, Andrew J., 4,521,881, Cl. 370-72.000.

Borsuk, Gerald M.; Chesson, Edwin E.; Beard, Jerome C.; and Lisle, Thomas K., Jr., to Westinghouse Electric Co. Simultaneous sampling dual transfer channel charge coupled device. 4,521,896, Cl. 377-60.000.

Borup, Alf L.; and Astrom, Erik G., to Swedish Rail System AB SRS. Method and apparatus for dispensing a working substance such as a lubricant. 4,520,901, Cl. 184-3.100.

BOSCH-SIEMENS HAUSGERAETE GmbH: *See*—
Speckhart, Max, 4,520,703, Cl. 83-478.000.

Bosna, Alexander: *See*—
Riccio, Louis M.; and Bosna, Alexander, 4,521,475, Cl. 428-142.000.

Bosna, Alexander A.: *See*—
Osial, Thaddeus A.; Bosna, Alexander A.; and Kulak, Richard J., 4,521,668, Cl. 219-121.0LC.

Bottomley, Paul A.; and Edelstein, William A., to General Electric Company. NMR Imaging of the transverse relaxation time using multiple spin echo sequences. 4,521,733, Cl. 324-309.000.

Bouchard, Andre C., to GTE Products Corporation. Compact fluorescent lamp having increased light output. 4,521,837, Cl. 362-216.000.

Boudakian, Max M., to Olin Corporation. Continuous process for the production of polybromopyridine compounds. 4,521,603, Cl. 546-304.000.

Bouiller, Jean G.; and Soligny, Marcel R., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Rotors of rotating machines. 4,521,160, Cl. 416-218.000.

Bouse, Vaclav: *See*—
Kuzel, Radomir; Broukal, Josef; and Bouse, Vaclav, 4,521,250, Cl. 106-15.050.

Bouzianis, George J.; and McIlvin, Donald B., to USM Corporation. Shoe upper cavity shell. 4,521,176, Cl. 425-521.000.

Bowen, Rafael L., to American Dental Association Health Foundation. Method for obtaining strong adhesive bonding of composites to dentin, enamel and other substrates. 4,521,550, Cl. 523-116.000.

Bowers, Cecil W.: *See*—
Peebles, William C., Jr.; and Bowers, Cecil W., 4,521,234, Cl. 55-481.000.

Boyd, Malcolm W.; and Mander, Michael G., to W. A. Goold Limited; and W. J. Goodwin & Son Limited. Containers for liquids. 4,520,940, Cl. 220-68.000.

Brand, Glen; and Chew, Timmy L. Four-way valve. 4,520,841, Cl. 137-270.000.

Brandes, Wilhelm: *See*—
Maurer, Fritz; Brandes, Wilhelm; Kuck, Karl-Heinz; Reinecke, Paul; and Scheinpflug, Hans, 4,521,420, Cl. 514-259.000.

Brandon, Craig A.: *See*—
Johnston, Lawton L.; and Brandon, Craig A., 4,520,520, Cl. 8-151.000.

Brandstatter, Hans G., to Ontario Research Foundation. Recovery of titanium values. 4,521,385, Cl. 423-76.000.

Brandt, Richard W., to Orchard Machinery Corporation. Deformable pad for tree clamping jaws. 4,521,468, Cl. 428-35.000.

Braun, Derrek E.; Lau, Daniel T.; and Moy, Harold, to United Technologies Automotive, Inc. Pressure sensitive piezoelectric signal generator assembly. 4,521,712, Cl. 310-339.000.

Braun, Martin, to Micronix Partners. High power x-ray source with improved anode cooling. 4,521,903, Cl. 378-141.000.

Brecht, Maria. Movable casing for the excavation of trenches. 4,521,137, Cl. 405-283.000.

Breidenstein, Charles J.: *See*—
Gueldenpfennig, Klaus; Russell, Stanley L.; Oswald, William A.; Breidenstein, Charles J.; and Narula, Karam V., 4,521,879, Cl. 370-62.000.

Breitenfellner, Franz, to Ciba Geigy Corporation. Thermoplastic polyester moulding composition containing flame retardant and magnesium sulfate. 4,521,560, Cl. 524-371.000.

Brenci, Massimo: *See*—
Sottini, Stefano; Brenci, Massimo; Righini, Giancarlo; Falciai, Riccardo; Russo, Vera; and Scheggi, Verga A., 4,521,070, Cl. 350-96.150.

Brenner, Robert A., to Whirlpool Corporation. Triple action agitator for automatic washers. 4,520,638, Cl. 68-133.000.

Brenner, Stewart: *See*—
Blumberg, Richard J.; Brenner, Stewart; and Robortaccio, Rocco J., 4,521,700, Cl. 307-456.000.

Brennstoffinstitut Freiberg: *See*—
Kretschmer, Horst; Tietze, Guenter; Noack, Juergen; Schweigel, Hans-Joachim; Schingnitz, Manfred; Werner, Klaus; and Kirsch, Bernd, 4,521,139, Cl. 406-19.000.

Bresson, Clarence R.: *See*—
Parlman, Robert M.; and Bresson, Clarence R., 4,521,300, Cl. 209-166.000.

Breuninger, Robert E., to Hinkle, John F., Jr.; and Stockdale, Wendell B., a part interest. Egg lathe. 4,520,753, Cl. 118-500.000.

Brewer, Carl T. Clutch actuator. 4,520,909, Cl. 192-0.02R.

Briard, Rene ; Saunier, Christian; and Canova, Guy, to Giravions Dorand. Method and apparatus for formation of a fictitious target in a training unit for aiming at targets. 4,521,196, Cl. 434-20.000.

Bridge, Richard F. Composite strip. 4,521,767, Cl. 340-555.000.

Bridgestone Tire Company Limited: *See*—
Ogino, Takao; Watanabe, Yoichi; and Sano, Shigehisa, 4,520,857, Cl. 152-527.000.
Ozawa, Chiaki, 4,521,269, Cl. 156-420.000.

Briggs, Jeffrey M.: *See*—
Halsey, Jay F.; and Briggs, Jeffrey M., 4,520,604, Cl. 52-200.000.

Brimhall, George H., Jr.; and Vigus, Leonard J., to University of California, The Regents of the. Rotary support for vacuum filtration apparatus. 4,521,308, Cl. 210-330.000.

Briner, Emil: *See*—
Stalder, Herbert; and Briner, Emil, 4,520,532, Cl. 19-244.000.

Bristol, James A.: *See*—
Sircar, Ila; and Bristol, James A., 4,521,416, Cl. 514-252.000.

British Nuclear Fuels plc: *See*—
Parkinson, Francis J., 4,521,162, Cl. 417-138.000.

British Telecommunications: *See*—
Falconer, Robert M., 4,521,745, Cl. 331-2.000.

Broecker, Franz J.; Gettert, Hans; and Kaempfer, Knut, to BASF Aktiengesellschaft. Purification of gases containing CO and/or CO_2. 4,521,387, Cl. 423-210.000.

Brogie, Earl W. Automobile shelter. 4,520,603, Cl. 52-173.00R.

Brooks, Robert M.: *See*—
Roettgen, Leslie A.; Webber, Beth A.; Brooks, Robert M.; and Layman, Robert J., 4,520,767, Cl. 123-41.100.

Broukal, Josef: *See*—
Kuzel, Radomir; Broukal, Josef; and Bouse, Vaclav, 4,521,250, Cl. 106-15.050.

Broussoux, Dominique; Facoetti, Hugues; Micheron, Francois; and Monnerie, Lucien, to Thomson-CSF. Process for manufacturing a piezo- or pyroelectric polymer material comprising a cross-linking step. 4,521,322, Cl. 252-62.900.

Brouwer, Gerardus J.: *See*—
Arnold, William; and Brouwer, Gerardus J., 4,520,903, Cl. 187-9.00R.

Brouwer Turf Equipment Limited: *See*—
Arnold, William; and Brouwer, Gerardus J., 4,520,903, Cl. 187-9.00R.

Brown, Anthony D., to Grundy Dispense Systems, Inc. Coupler. 4,520,954, Cl. 222-400.800.

Brown, Boveri & Cie. AG: *See*—
Klein, Erwin, 4,521,170, Cl. 357-81.000.

Brown, Dennis N. Skate boot insert. 4,520,580, Cl. 36-44.000.

Brown, Pamela: *See*—
Southgate, Robert; and Brown, Pamela, 4,521,337, Cl. 534-560.000.

Brown, Richard, to RCA Corporation. Method of fabricating an electronic circuit including an aperture through the substrate thereof. 4,520,561, Cl. 29-840.000.

Brown, Thomas H.; and Durant, Graham J., to Smith Kline & French Laboratories Limited. Guanidinothiazolyl derivatives. 4,521,418, Cl. 514-272.000.

Brown, Thomas H.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Dioxocyclobutene compounds. 4,521,625, Cl. 564-461.000.

Browning, George W.: *See*—
Linklater, Peter M.; and Browning, George W., 4,521,433, Cl. 426-36.000.

Bruce, Kenneth E.; Lombardo, Ralph M., Jr.; Tarbox, Bruce H.; and Conway, John W., to Honeywell Information Systems Inc. Intersystem fault detection and bus cycle completion logic system. 4,521,848, Cl. 364-200.000.

Bruil, Hendrik G.: *See*—
Seibert, Karl; Neumann, Klaus; Spiess, Ernst; and Bruil, Hendrik G., 4,521,326, Cl. 252-174.210.

Brumbaugh, Donald L.: *See*—
Wang, Anthony D.; and Brumbaugh, Donald L., 4,521,765, Cl. 340-347.0DA.

Bruns, Engelbert: *See*—
Lorenz, Kurt; Bruns, Engelbert; and Osterholt, Gerd, 4,521,279, Cl. 202-227.000.

Bryans, Lawrence G.; Goudey, Kenneth R.; and Nickerson, William F., to Ford Aerospace & Communications Corporation. Offset microwave feed horn for producing focused beam having reduced sidelobe radiation. 4,521,783, Cl. 343-781.00R.

bso Steuerungstechnik GmbH: *See*—
Gibas, Cristoph, 4,521,759, Cl. 335-255.000.

Bubeck, Robert A.; and Arends, Charles B., to Dow Chemical Company, The. Impact styrene polymer. 4,521,569, Cl. 525-316.000.

Buch, Thomas: *See*—
Steinhauser, Thomas; and Buch, Thomas, 4,521,001, Cl. 266-208.000.

Buckley, John D.; Swaim, Robert J.; Fox, Robert L.; and Johnston, David F., to United States of America, National Aeronautics & Space Administration. Induction heating gun. 4,521,659, Cl. 219-10.770.

Buckner, Michael T.: *See*—
St. Pierre, Philippe D.; and Buckner, Michael T., 4,521,222, Cl. 51-295.000.

Budapesti Radiotechnikai Gyar: *See*—
Nemet, Mihaly, 4,521,784, Cl. 343-846.000.

Budd, Richard W. Decorative molding for tub or counter caulking. 4,520,605, Cl. 52-287.000.

Budinger, A. Bowman: *See*—
Byszewski, Wojciech W.; Budinger, A. Bowman; and Proud, Joseph M., 4,521,718, Cl. 315-99.000.

Budnik, Brian J., to Motorola, Inc. Control circuitry for a pulse-width-modulated switching power supply. 4,521,726, Cl. 323-283.000.

Buendia, Jean: *See*—
Martel, Jacques; Buendia, Jean; and Nezot, Francois, 4,521,331, Cl. 252-522.00R.
Bultemeier, Keith D.: *See*—
Hilker, G. Daniel; Lausen, Verne H.; Coon, Jessie H.; Bodette, James E.; Grimes, Jerry L.; Wright, Roger D.; Disque, Donny R.; and Bultemeier, Keith D., 4,521,173, Cl. 425-113.000.
Bulvanoski, Leo J.: *See*—
Di Martini, Carl R.; Howe, Herbert E.; Scott, William L.; and Bulvanoski, Leo J., 4,521,247, Cl. 75-77.000.
Bunker, Keith G.: *See*—
Ziehm, Richard T.; Wilczek, Stephen P.; Baker, George E.; Husted, Raymond R.; Dumas, Glen A.; Bunker, Keith G.; and Place, George H., Jr., 4,521,847, Cl. 364-184.000.
Bunnell, Edward D., to AMP Incorporated. Tool for matrix connector. 4,520,558, Cl. 29-749.000.
Burgdorf, Jochen: *See*—
Belart, Juan; Burgdorf, Jochen; Weise, Lutz; Kircher, Dieter; and Goossens, Andre F. L., 4,521,061, Cl. 303-114.000.
Burkhardt, Werner: *See*—
Arntz, Dietrich; Prescher, Gunter; Burkhardt, Werner; Heilos, Johannes; and Manner, Reinhard, 4,521,618, Cl. 562-535.000.
Burl, Michael; and Young, Ian R., to Picker International, Ltd. Nuclear magnetic resonance method and apparatus. 4,520,828, Cl. 128-653.000.
Burlington Industries, Inc.: *See*—
Schnegg, Julius R., 4,520,636, Cl. 66-192.000.
Burnham, Robert F.; Gibbon, Alan; and Harry, John E., to Johnson Matthey Public Limited Company. Plasma arc furnaces. 4,521,890, Cl. 373-22.000.
Burns, Mike L.: *See*—
Sillivent, Bob; and Sillivent, Clifford, 4,520,917, Cl. 198-499.000.
Burr-Brown Corporation: *See*—
Wang, Anthony D.; and Brumbaugh, Donald L., 4,521,765, Cl. 340-347.0DA.
Burton, C. Leonard: *See*—
Klein, Gregory L.; and Burton, C. Leonard, 4,521,121, Cl. 384-100.000.
Burton, David P., to Analog Devices Incorporated. Signal-controllable attenuator employing a digital-to-analog converter. 4,521,764, Cl. 340-347.0DA.
Burzin, Klaus: *See*—
Droscher, Michael; Gerth, Christian; and Burzin, Klaus, 4,521,554, Cl. 523-522.000.
Busch, Peter: *See*—
Schumann, Henning; Busch, Peter; Fischer, Detlef; and Thiele, Klaus, 4,520,831, Cl. 132-11.00R.
Buschmann, Ernst: *See*—
Meyer, Norbert; Zeeh, Bernd; Buschmann, Ernst; and Pommer, Ernst-Heinrich, 4,521,429, Cl. 514-383.000.
Bush Universal, Inc.: *See*—
Allard, Jules N., 4,520,522, Cl. 12-40.500.
Butler, Derek W.: *See*—
McVie, James; and Butler, Derek W., 4,521,461, Cl. 427-387.000.
Butt, Sheldon H.; Smith, Edward F., III; and Gyurina, F. Dennis, to Olin Corporation. Casing for electronic components. 4,521,469, Cl. 428-35.000.
Butterwick, Gilbert N., to RCA Corporation. Silicon target support assembly for an image sensing device. 4,521,713, Cl. 313-378.000.
Buttinoni, Ada: *See*—
Doria, Gianfederico; Passarotti, Carlo; Lovisolo, Pier P.; and Buttinoni, Ada, 4,521,419, Cl. 514-267.000.
Byford, Roger G.: *See*—
Sturges, Robert H., Jr.; Birsa, Joseph J.; Dawson, Paul H.; and Byford, Roger G., 4,521,844, Cl. 364-167.000.
Bynum, Byron G., to Motorola, Inc. Bipolar-MOS current amplifier having active turn-off circuitry. 4,521,737, Cl. 330-51.000.
Byszewski, Wojciech W.; Budinger, A. Bowman; and Proud, Joseph M., to GTE Laboratories Incorporated. Beam mode lamp with voltage modifying electrode. 4,521,718, Cl. 315-99.000.
Cadbury Schweppes Public Limited Company: *See*—
Jeans, Edward L., 4,520,950, Cl. 222-129.100.
Cain, Paul A., to Union Carbide Corporation. Pesticidal bicyclooxyheterocyclyl aroyl ureas. 4,521,426, Cl. 514-346.000.
Calderon, Jose L.; and Layrisse, Ignacio, to Intevep, S.A. Apparatus for upgrading heavy hydrocarbons employing a diluent. 4,521,277, Cl. 196-46.000.
Calderoni, Sergio L., to General Motors Corporation. Spring retainer. 4,521,005, Cl. 267-179.000.
Caldwell, David; Ferrio, Linda J.; and Hunter, Arthur C., to Texas Instruments Incorporated. Electronic data processing apparatus with equation operating system having improved exponentiation operators. 4,521,868, Cl. 364-753.000.
Caldwell, William F. Vibration-isolating mounting with load-directing chamfer. 4,521,004, Cl. 267-141.400.
Callaghan, Edward P. Methods and apparatus for bandwidth reduction. 4,521,646, Cl. 375-122.000.
Callaghan, Vincent M.: *See*—
Peck, Daniel A.; and Callaghan, Vincent M., 4,521,371, Cl. 376-245.000.
Calvagno, Michael J. Garage door safety locking system. 4,520,591, Cl. 49-322.000.
Camco, Incorporated: *See*—
Pringle, Ronald E., 4,520,870, Cl. 166-317.000.
Campi, Morris; and Sindoris, Arthur R., to United States of America, Army. Phase scanned microstrip array antenna. 4,521,781, Cl. 343-700.0MS.
Canada, Ronald G.; Piety, Kenneth R.; Simpson, Daniel G.; and Pardue, E. Forrest, to Technology for Energy Corporation. Vibration monitoring device. 4,520,674, Cl. 73-660.000.
Canadian General Electric Company Limited: *See*—
deHertel Eastcott, Peter; and Trussler, Ronald C., 4,520,910, Cl. 192-0.02R.
Candau, Francoise; Leong, Yee-Sing; Kohler, Norbert; and Dawans, Francois, to Institut Francais du Petrole. Process for manufacturing a microlatex in a continuous oil phase by polymerization of a water-soluble monomer in a water-in-oil microemulsion, resultant microlatices, and their use for enhanced oil recovery. 4,521,317, Cl. 252-8.55D.
Canon Kabushiki Kaisha: *See*—
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; Koumura, Noboru; and Kazuma, Koji, 4,521,805, Cl. 358-75.000.
Katayama, Hajime; Nitanda, Hiroshi; Nagaoka, Tateki; Kishi, Hirotoshi; Takada, Yusaku; Iida, Noriyoshi; Inuzuka, Tsuneki; and Komiya, Yutaka, 4,521,099, Cl. 355-8.000.
Kawabata, Takashi; and Yamada, Masanori, 4,521,093, Cl. 354-403.000.
Matsufuji, Yohji, 4,521,785, Cl. 346-25.000.
Suzuki, Akiyoshi; Sato, Hiroshi; Omata, Takashi; and Kosugi, Masao, 4,521,082, Cl. 350-405.000.
Yokota, Masami; Sugitani, Hiroshi; and Inamoto, Tadayoshi, 4,521,787, Cl. 346-140.00R.
Yonemori, Takaji; and Sagara, Seiji, 4,521,100, Cl. 355-8.000.
Canova, Guy: *See*—
Briard, Rene ; Saunier, Christian; and Canova, Guy, 4,521,196, Cl. 434-20.000.
Caracteres S.A.: *See*—
Moulin, Blaise, 4,521,124, Cl. 400-144.200.
Carafeno, Joseph A. Toy baseball bat device. 4,521,015, Cl. 273-26.00B.
Caramaschi, Vittorio; and Castelli, Pier L., to Costruzioni Aeronautiche Giovanni Agusta S.p.A. Helicopter rotor hub. 4,521,157, Cl. 416-134.00A.
Carbeau, Richard W.; Martin, James F.; Lanier, John H.; and Holt, William L., to ENSCO, Inc. Waste disposal. 4,520,741, Cl. 110-344.000.
Carbone, Douglas C.; and Dennis, Philip J., to GTE Products Corporation. Miniaturized circuit breaker. 4,521,760, Cl. 337-368.000.
Careddu, Franco, to Sugherificio P. Careddu S.p.A. Method of manufacturing corks for bottles. 4,521,266, Cl. 156-242.000.
Carl Still GmbH & Co. KG, Firma: *See*—
Lorenz, Kurt; Bruns, Engelbert; and Osterholt, Gerd, 4,521,279, Cl. 202-227.000.
Carl-Zeiss-Stiftung: *See*—
Schulte in den Baumen, Joachim, 4,521,068, Cl. 350-1.100.
Weber, Klaus; Willert, Manfred; and Blessmann, Heinz, 4,521,076, Cl. 350-254.000.
Carl-Zeiss-Stuftung, Heidenheim/Brenz: *See*—
Herzog, Klaus; Szenger, Franz; and Gentner, Gabriele, 4,520,700, Cl. 82-31.000.
Carli, Alvin J.: *See*—
Meyer, Lawrence L.; and Carli, Alvin J., 4,520,684, Cl. 74-89.210.
Carlqvist, Stig G., to Stig G. Carlqvist Motor Consultant (CMC) AB. Method for compressing and heating a heating medium to be externally supplied to an engine while using the energy available in the hot exhaust gases of the engine. 4,520,628, Cl. 60-616.000.
Carlson, Eric R.; and Schneider, Martin V., to AT&T Bell Laboratories. Symmetrical low-loss suspended substrate stripline. 4,521,755, Cl. 333-244.000.
Carpenter, Brian M., to Coal Industry (Patents) Limited. Combustion and heating equipment. 4,520,740, Cl. 110-288.000.
Carpenter, Keith H., to General Motors Corporation. Pressure balanced valve for adjustable hydraulic damper. 4,520,908, Cl. 188-319.000.
Carroll, Robert A. Fire alarm system. 4,521,645, Cl. 179-5.00R.
Carter, James H.; Ledis, Stephen L.; and Crews, Harold R., to Coulter Electronics, Inc. Multi-purpose blood diluent and lysing agent for differential determination of lymphoid-myeloid population of leukocytes. 4,521,518, Cl. 436-10.000.
Case, Allen W., Jr.; and Peroutky, Donald C., to General Electric Company. Gas metal arc welding torch with vision system. 4,521,670, Cl. 219-130.010.
Casey, Thomas J. Apparatus and method for the treatment of organic wastes. 4,521,310, Cl. 210-603.000.
Casper, James A. Dental analyzer. 4,521,187, Cl. 433-72.000.
Cassella Aktiengesellschaft: *See*—
Engelhardt, Friedrich; Schmitz, Hermann; Gulden, Walter; and Hax, Jorg, 4,521,579, Cl. 526-287.000.
Castelli, Pier L.: *See*—
Caramaschi, Vittorio; and Castelli, Pier L., 4,521,157, Cl. 416-134.00A.
Caterpillar Tractor Co.: *See*—
Englund, Michael S.; Hafele, Joseph C.; and Schulze, Dwain C., Jr., 4,520,652, Cl. 73-23.000.
Grawey, Charles E., 4,520,868, Cl. 165-158.000.
Oswald, Charles W., 4,521,650, Cl. 200-61.880.
Phelps, Weldon L.; and Stahl, Alan L., 4,521,856, Cl. 364-426.000.
Cavalleri, Robert J.; and Clark, William E. Low frictional loss rotary vane gas compressor having superior lubrication characteristics. 4,521,167, Cl. 418-82.000.
Cebal: *See*—
Edelmann, Gilbert, 4,520,730, Cl. 101-426.000.

Central Glass Company, Limited: *See*—
Kandachi, Takayoshi; Okino, Seiki; Yanai, Toshiharu; and Tanaka, Katsuto, 4,521,454, Cl. 427-168.000.

Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See*—
Ponghis, Nikolas G.; and Poos, Arthur G., 4,521,246, Cl. 75-42.000.

Centrifugal Piston Expander, Inc.: *See*—
Dibrell, Edwin W., 4,520,632, Cl. 62-403.000.

Cerny, David E., to Respiratory Care, Inc. Safety connector for flexible tube device. 4,521,038, Cl. 285-24.000.

Chaborski, Hoiko; and Mehnert, Walter, to MITEC Moderne Industrietechnik GmbH. Apparatus for measuring distances by measuring time of travel of a measuring light pulse. 4,521,107, Cl. 356-5.000.

Chabrerie, Jean-Pierre: *See*—
Saint-Michel, Jacques A.; Chabrerie, Jean-Pierre; and Mailfert, Alain, 4,521,709, Cl. 310-186.000.

Chadshay, Roman: *See*—
McCartney, Michael S.; Chadshay, Roman; and Erlacher, Richard F., 4,520,739, Cl. 110-263.000.

Challen, Richard F., to General Electric Company. Battery saving frequency synthesizer arrangement. 4,521,918, Cl. 455-343.000.

Chamberlain, Joseph G. Jacketed wood stove. 4,520,791, Cl. 126-121.000.

Champion International Corporation: *See*—
Allen, Robert L., 4,521,492, Cl. 428-464.000.

Champion Spark Plug Company: *See*—
Seitz, David M.; and Weinstein, Richard, 4,520,949, Cl. 222-108.000.

Chan, George W.; and Sitrin, Robert D., to SmithKline Beckman Corporation. Aglycone and pseudo-aglycones of the AAD 216 antibiotics. 4,521,335, Cl. 260-112.50R.

Chang, Glenn E. C.: *See*—
Jones, Robert J.; and Chang, Glenn E. C., 4,521,623, Cl. 564-430.000.

Chang, Kai: *See*—
Tahim, Raghbir S.; Hayashibara, George M.; and Chang, Kai, 4,521,747, Cl. 331-107.0SL.

Chang, Tiang-Shing; and Zientek, Lucy J., to Block Drug Company, Inc. Denture fixative composition containing partially neutralized copolymers of maleic acid or anhydride and alkyl vinyl ethers which are optionally partially crosslinked. 4,521,551, Cl. 523-120.000.

Chao, Tai-Hsiang; and Cleary, Michael T., to UOP Inc. Process for separating fatty acids from rosin acids with phosphorus modified alumina molecular sieve. 4,521,343, Cl. 260-419.000.

Chapman, G. Paul, to Decorative Designs, Inc. Decorative plate apparatus. 4,521,464, Cl. 428-33.000.

Characklis, William G. Measurement of build-up of fouling deposits by sensing flow characteristics during brief flow excursions. 4,521,864, Cl. 364-563.000.

Chas. M. Bailey Co., Inc.: *See*—
Dixon, Robert W., 4,520,846, Cl. 137-625.300.

Chemische Werke Huels AG: *See*—
Drescher, Michael; Gerth, Christian; and Burzin, Klaus, 4,521,554, Cl. 523-522.000.

Chemische Werke Huls AG: *See*—
Hofmann, Peter, 4,521,526, Cl. 502-24.000.

Chen, Robert G.; Patel, Arvind D.; and Sample, Thomas E., Jr., to Dresser Industries, Inc. Composition and method of preparation of novel aqueous drilling fluid additives. 4,521,578, Cl. 526-288.000.

Chenausky, Peter P.; Mongeon, Robert J.; and Laughman, Lanny M., to United Technologies Corporation. Passively Q-switched dual laser. 4,521,109, Cl. 356-349.000.

Cherill, Robert J.: *See*—
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,521,537, Cl. 514-302.000.

Chervenak, Michael C.; Eccles, Richard M.; and Nongbri, Govanon, to HRI, Inc. Sustained high hydroconversion of petroleum residua feedstocks. 4,521,295, Cl. 208-59.000.

Chesson, Edwin E.: *See*—
Borsuk, Gerald M.; Chesson, Edwin E.; Beard, Jerome C.; and Lisle, Thomas K., Jr., 4,521,896, Cl. 377-60.000.

Chevron Research Company: *See*—
Blanton, William A., Jr.; and Dimpel, William L., 4,521,389, Cl. 423-235.000.
Erdman, Timothy R., 4,521,319, Cl. 252-47.500.
Loh, William, 4,521,240, Cl. 71-88.000.
Plavac, Frank, 4,521,610, Cl. 560-27.000.
Silcox, William H., 4,521,135, Cl. 405-224.000.
Spars, Byron G.; Klett, Robert J.; and Wallman, P. Henrik, 4,521,292, Cl. 208-11.00R.

Chew, Timmy L.: *See*—
Brand, Glen; and Chew, Timmy L., 4,520,841, Cl. 137-270.000.

Chinn, Albert E.: *See*—
King, Harold B.; Masaitis, William; Ippisch, Ernest; and Chinn, Albert E., 4,521,862, Cl. 364-552.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Soos, Rudolf; Kolta, Rezso; Zoltan, Sandor; and Tary, Maria, 4,521,612, Cl. 560-124.000.

Chiou, George C. Y.; and Liu, Hsin-Kuang, to Texas A&M University System, The. Ophthalmic compositions and their use for treating elevated intraocular pressure and glaucoma. 4,521,414, Cl. 514-229.000.

Chisso Corporation: *See*—
Kawamura, Yasuo; Nishiyama, Tadashi; Itoh, Tomiyoshi; and Sakai, Takuo, 4,521,406, Cl. 424-94.000.

Cho, Byong K., to General Motors Corporation. Monolithic catalytic converter for improved thermal performance. 4,521,532, Cl. 502-439.000.

Cholley, Henri E.; Laupretre, Jean J.; and Rollet, Jean, to Foptica. Optical cable designed to withstand high pressures. 4,521,072, Cl. 350-96.230.

Chow, William C.: *See*—
Rasmussen, Donald O.; Chow, William C.; and Davio, Franklin J., 4,520,970, Cl. 242-195.000.

Christ, Richard; Muller, Erhard; Knackstedt, Hans-Gunther; and Laug, Reiner, to Transnuklear GmbH. Shielding container having neutron shielding for the transportation and/or storage of radioactive material. 4,521,691, Cl. 250-506.100.

Christen, Jimmie D.; and Taylor, Henry B., III, to Dow Chemical Company, The. Preparation of polyether polyols. 4,521,548, Cl. 521-167.000.

Churchill, Howard. Tree stand. 4,520,935, Cl. 211-124.000.

Cialone, Robert A. Method and kit for constructing an aesthetic and functional temporary denture. 4,521,193, Cl. 433-199.000.

Ciammaichella, Richard C.: *See*—
Bohl, Thomas L.; and Ciammaichella, Richard C., 4,521,089, Cl. 350-582.000.

Ciba-Geigy AG: *See*—
Jan, Gerald; and Lenoir, John, 4,521,591, Cl. 534-821.000.

Ciba Geigy Corporation: *See*—
Breitenfellner, Franz, 4,521,560, Cl. 524-371.000.
Kristinsson, Haukur; and Topfl, Wernér, 4,521,597, Cl. 544-3.000.
Spivack, John D.; and Pastor, Stephen D., 4,521,320, Cl. 252-47.500.

Cieloszyk, Gary S.: *See*—
Lee, Kiu H.; and Cieloszyk, Gary S., 4,521,573, Cl. 526-125.000.

Cincinnati Milacron Inc.: *See*—
Holmes, Donald P.; and McDonald, David I., 4,520,575, Cl. 34-23.000.

Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, to Kraftwerk Union Aktiengesellschaft. Microstrip capacitor for energy storage, preferably for high-energy lasers. 4,521,889, Cl. 372-87.000.

Clairol Incorporated: *See*—
Skovdal, Jorgen, 4,520,832, Cl. 132-33.00R.

Clarion Co., Ltd.: *See*—
Okamoto, Takeshi; and Minagawa, Shoichi, 4,521,711, Cl. 310-313.00B.

Clark, Jim W.: *See*—
Doescher, George C.; and Clark, Jim W., 4,521,140, Cl. 408-97.000.

Clark, Keith E.; and Woods, Charles E., to United States of America, Navy. Stabilized gimbal platform. 4,520,973, Cl. 244-3.160.

Clark, Lloyd D.; Wilcox, Jean K.; and Day, Gene F., to Xerox Corporation. Ion projection printer with charge compensation source. 4,521,792, Cl. 346-159.000.

Clark, William E.: *See*—
Cavalleri, Robert J.; and Clark, William E., 4,521,167, Cl. 418-82.000.

Clarke, James W.; Kimber, Geoffrey M.; Rantell, Terry D.; and Snape, Colin E., to Coal Industry (Patents) Limited. Coal extraction. 4,521,291, Cl. 208-8.0LE.

Class, Jay B., to Hercules Incorporated. Fiber filter and stabilizer formulation. 4,521,493, Cl. 428-498.000.

Classen, Theodore M.: *See*—
Scinta, James; and Classen, Theodore M., 4,521,293, Cl. 208-11.0LE.

Claude, Oudet, to Portescap. Method and device for braking an assembly comprising a two-phase synchronous motor. 4,521,723, Cl. 318-696.000.

Claudio, Fuzzi, to Eurobeva Engineering Trust. Method and machine for the packaging of articles with a stretchable foil. 4,520,613, Cl. 53-441.000.

Cleary, Michael T.: *See*—
Chao, Tai-Hsiang; and Cleary, Michael T., 4,521,343, Cl. 260-419.000.

Clegg, John E. Conical middle component microscopic lenses. 4,521,085, Cl. 350-432.000.

Clum Mfg. Co. Inc.: *See*—
Krubsack, Larry J., 4,521,758, Cl. 335-131.000.

Clusener, Gerhard R.: *See*—
Stepke, Anthony C.; and Clusener, Gerhard R., 4,521,119, Cl. 374-56.000.

Coal Industry (Patents) Limited: *See*—
Carpenter, Brian M., 4,520,740, Cl. 110-288.000.
Clarke, James W.; Kimber, Geoffrey M.; Rantell, Terry D.; and Snape, Colin E., 4,521,291, Cl. 208-8.0LE.
Eagles, Brian A.; and French, Albert G., 4,521,058, Cl. 299-81.000.

Coates, John S., to Du Pont de Nemours, E. I., and Company. Catalyst for anthraquinone hydrogen peroxide process. 4,521,531, Cl. 502-242.000.

Coates, Vincent J.; Grund, J. Evan; and Westrate, Stephen B., to Nanometrics Incorporated. Linewidth measuring with linearity calibration of the T.V. camera tube. 4,521,686, Cl. 250-237.00R.

Coblentz, Andrea; Lefevre, Didier; Colombani, Pascal; and Meunier, Denis, to Schlumberger Technology Corp. Methods and apparatus for determining flow characteristics of a fluid in a well from temperature measurements. 4,520,666, Cl. 73-155.000.

Codman & Shurtleff, Inc.: *See*—
Mickiewicz, Stanley, 4,520,818, Cl. 128-303.170.

Cody, Michael J.; and Spykerman, Scott A., to Prince Corporation. Visor with mirror and storage means. 4,521,051, Cl. 296-97.00H.

Coe, David J.; and Lowis, Royce, to U.S. Philips Corporation. Insulated-gate field-effect transistors. 4,521,795, Cl. 357-23.400.
Cohen, Alan P. High volume oral evacuator. 4,521,185, Cl. 433-31.000.
Cole, Clinton W.; and Beach, Verlin R., to Halliburton Company. Cover retainer. 4,520,837, Cl. 137-68.00R.
Coleman, Donald J., Jr.; Haken, Roger A.; and Wang, Chung S., to Texas Instruments Incorporated. Method for depositing polysilicon over TiO_2. 4,521,446, Cl. 427-86.000.
Collins, Albert R., to Grefco, Inc. Method and apparatus for heating particulate material. 4,521,182, Cl. 432-13.000.
Colombani, Pascal: *See*—
Coblentz, Andrea; Lefevre, Didier; Colombani, Pascal; and Meunier, Denis, 4,520,666, Cl. 73-155.000.
Combustion Engineering, Inc.: *See*—
Baker, Robert D.; Driggers, Gerald W.; Gray, Ronald W.; and Hawkins, Lawrence A., 4,521,229, Cl. 55-137.000.
Covell, Russell B., 4,520,760, Cl. 122-7.00R.
McCartney, Michael S.; Chadshay, Roman; and Erlacher, Richard F., 4,520,739, Cl. 110-263.000.
Peck, Daniel A.; and Callaghan, Vincent M., 4,521,371, Cl. 376-245.000.
Commissariat a l'Energie Atomique: *See*—
Pigeon, Michel; and Saglio, Robert, 4,521,150, Cl. 414-749.000.
Commonwealth of Australia, The: *See*—
Linklater, Peter M.; and Browning, George W., 4,521,433, Cl. 426-36.000.
Robinson, Paul R., 4,520,711, Cl. 89-1.50D.
Compagnie Francaise de l'Azote Cofaz: *See*—
Mouille , Bernhard; and Durand, Michel, 4,521,390, Cl. 423-239.000.
Compagnie Francaise des Petroles: *See*—
Marais, Lionel, 4,520,886, Cl. 173-135.000.
Compagnie General d'Electricite: *See*—
Belouet, Christian, 4,520,752, Cl. 118-405.000.
Compagnie Generale des Etablissements Michelin: *See*—
Pomm.er, Jean, deceased, 4,520,856, Cl. 152-454.000.
Cone, Richard E., to Spalding & Evenflo Companies, Inc. Booster seat. 4,521,052, Cl. 297-3.000.
Connelly, Dale L., to United States of America, National Aeronautics & Space Administration. Light transmitting window assembly. 4,521,077, Cl. 350-319.000.
Consiglio Nazionale Delle Ricerche: *See*—
Sottini, Stefano; Brenci, Massimo; Righini, Giancarlo; Falciai, Riccardo; Russo, Vera; and Scheggi, Verga A., 4,521,070, Cl. 350-96.150.
Conway, John W.: *See*—
Bruce, Kenneth E.; Lombardo, Ralph M., Jr.; Tarbox, Bruce H.; and Conway, John W., 4,521,848, Cl. 364-200.000.
Cook, Brian A.; and Quintin, Philip G. Strip lighting system. 4,521,839, Cl. 362-238.000.
Coomes, Pamela R.: *See*—
Coomes, Raymond G.; and Coomes, Pamela R., 4,520,715, Cl. 98-101.000.
Coomes, Raymond G.; and Coomes, Pamela R. Energy-saving cover apparatus for room air registers. 4,520,715, Cl. 98-101.000.
Coon, Jessie H.: *See*—
Hilker, G. Daniel; Lausen, Verne H.; Coon, Jessie H.; Bodette, James E.; Grimes, Jerry L.; Wright, Roger D.; Disque, Donny R.; and Bultemeier, Keith D., 4,521,173, Cl. 425-113.000.
CooperVision, Inc.: *See*—
Houlsby, Robert D., 4,521,375, Cl. 422-29.000.
Corbett, Reg D. Centrifugal fans. 4,521,154, Cl. 416-175.000.
Corder, Thomas E.: *See*—
Pezzolo, Donald E.; Pfeiffer, James W.; and Corder, Thomas E., 4,521,843, Cl. 364-145.000.
Cordier, Bernard; and Berge, Christian, to Societe Nationale Elf Aquitaine (Production). System for detecting a native reservoir fluid in a well bore. 4,520,665, Cl. 73-155.000.
Cordis Corporation: *See*—
Heimer, Malcolm L., 4,521,743, Cl. 330-296.000.
Cornell Research Foundation, Inc.: *See*—
Bauman, Dale E., 4,521,409, Cl. 514-21.000.
Cortese, Nicholas A., Jr.; and Gastrock, William H., to American Cyanamid Company. Method for the preparation of 1,5-bis-aryl-1,4-pentadien-3-ones. 4,521,629, Cl. 568-313.000.
Cosby, Theodore E.; and Cunningham, Patrick J., to Cunningham, Patrick J. Variable resistance exercise apparatus and improved method of exercising. 4,521,012, Cl. 272-73.000.
Costarelli, Edoardo. Screw drier particularly for plastic materials. 4,520,724, Cl. 100-935.000.
Coste, Steven D.: *See*—
Rado, David J.; and Coste, Steven D., 4,520,904, Cl. 187-29.00R.
Costruzioni Aeronautiche Giovanni Agusta S.p.A.: *See*—
Caramaschi, Vittorio; and Castelli, Pier L., 4,521,157, Cl. 416-134.00A.
Cotchonis, N. Eugene. Golf ball position marker. 4,521,018, Cl. 273-32.00A.
Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Phenolic antioxidants. 4,521,559, Cl. 524-289.000.
Coulter Electronics, Inc.: *See*—
Carter, James H.; Ledis, Stephen L.; and Crews, Harold R., 4,521,518, Cl. 436-10.000.
Coulter Systems Corporation: *See*—
Kuehnle, Manfred R.; Perry, George J.; and Rose, Robert M., 4,521,097, Cl. 355-3.00R.
Cournoyer, Bernard T.; and Hedstrom, Norman A., to Wright Line Inc. Cable bushing. 4,520,976, Cl. 248-56.000.
Courtney, Thomas F., Jr.: *See*—
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,521,613, Cl. 560-152.000.
Covell, Russell B., to Combustion Engineering, Inc. Heat exchanger outlet arrangement. 4,520,760, Cl. 122-7.00R.
Cowart, Ronald W.: *See*—
Ong, Poen S.; Zermeno, Alfonso; Marsh, Lee M., Jr.; Hevezi, James M.; and Cowart, Ronald W., 4,521,808, Cl. 358-111.000.
Cowell, Mark: *See*—
Lares, Joseph P.; and Cowell, Mark, 4,521,189, Cl. 433-84.000.
Cox, Russell C.; and McElroy, Arthur H. Pipe connection. 4,521,041, Cl. 285-156.000.
CPC International Inc.: *See*—
Lemme, Christopher J.; and Frankiewicz, Jeffrey R., 4,521,516, Cl. 435-253.000.
Craig, Dwin R. Apparatus and method for producing photographic records of transparencies. 4,521,104, Cl. 355-20.000.
Cramer, Gottfried; and Krumm, Valentin, to Lindauer Dornier Gesellschaft mbH. Apparatus in a shuttleless weaving machine for making a selvage. 4,520,850, Cl. 139-194.000.
Cramer, Rudolph E.: *See*—
Ouwerkerk, Johannes H. W.; Lucieer, Wouter B.; and Cramer, Rudolph E., 4,521,117, Cl. 366-165.000.
Crawford, John G., to Black & Decker, Inc. Power pierce can opener. 4,520,567, Cl. 30-424.000.
Crawford, John S., to Technical Components Pty. Ltd. Gas ignition circuits. 4,521,825, Cl. 361-253.000.
CRC Chemicals Inc.: *See*—
Facey, Roy B., 4,520,951, Cl. 222-182.000.
Crehan, Patrick J.: *See*—
Kennedy, Richard B., 4,521,544, Cl. 521-107.000.
Crews, Harold R.: *See*—
Carter, James H.; Ledis, Stephen L.; and Crews, Harold R., 4,521,518, Cl. 436-10.000.
Crookes, Derek L., to Glaxo Group Limited. Aminoalkyl furan derivative. 4,521,431, Cl. 514-471.000.
Crosby, Gaius P.; and James, Thomas A., to James, Thomas A. Lightweight safe and door mechanism therefor. 4,520,736, Cl. 109-60.000.
Crosilla, Danilo A.: *See*—
Asselin, Andre A.; Crosilla, Danilo A.; and Humber, Leslie G., 4,521,606, Cl. 548-503.000.
Cross, Dan A.: *See*—
Bloch, Joseph T.; and Cross, Dan A., 4,520,966, Cl. 242-54.00R.
Cross, William E.: *See*—
Nestor, Charles R.; Plyler, Robert G.; and Cross, William E., 4,521,065, Cl. 339-75.0MP.
Crowell, Douglas H.: *See*—
Morse, Albert I.; Crowell, Douglas H.; and Gilligan, Thomas J., III, 4,520,751, Cl. 118-203.000.
Cselt Centro Studi E Laboratori Telecomunicazioni S.p.A.: *See*—
Gabrielli, Luciano; and Sposini, Maurizio, 4,521,882, Cl. 370-85.000.
Csepel Muvek Femmuve: *See*—
Domokos, Sipos, 4,521,455, Cl. 427-178.000.
Cummings, Lewis W.: *See*—
Reichenbach, Dean H.; Stang, John H.; Cummings, Lewis W.; Glasson, Richard E.; and Ruthmansdorfer, David A., 4,520,627, Cl. 60-599.000.
Cummins Engine Company: *See*—
Roettgen, Leslie A.; Webber, Beth A.; Brooks, Robert M.; and Layman, Robert J., 4,520,767, Cl. 123-41.100.
Cummins Engine Company, Inc.: *See*—
Reichenbach, Dean H.; Stang, John H.; Cummings, Lewis W.; Glasson, Richard E.; and Ruthmansdorfer, David A., 4,520,627, Cl. 60-599.000.
Villanyi, Tibor J., 4,520,542, Cl. 29-224.000.
Cummins, George E. Speed differential device. 4,520,692, Cl. 74-799.000.
Cunningham, Patrick J.: *See*—
Cosby, Theodore E.; and Cunningham, Patrick J., 4,521,012, Cl. 272-73.000.
Curtis, Jeffrey B.: *See*—
Winkler, Dean M.; Curtis, Jeffrey B.; and Heller, Aaron J., 4,521,865, Cl. 364-608.000.
Cuscurida, Michael; and Peterson, Bruce W., to Texaco Inc. Epoxy resin modified polyether polyols from mixed initiators. 4,521,572, Cl. 525-507.000.
Cuscurida, Michael: *See*—
Dominguez, Richard J. G.; and Cuscurida, Michael, 4,521,581, Cl. 528-57.000.
Cushman, Robert L.; Koester, Arlan; and Eveland, Michael, to Halsey Taylor Division of King-Seeley Thermos Co. Barrier-free water cooler. 4,520,960, Cl. 239-29.000.
Custom Laboratories, Inc.: *See*—
Theslof, Gene, Jr., 4,521,091, Cl. 353-122.000.
CVI Incorporated: *See*—
Sarcia, Domenico S., 4,520,630, Cl. 62-6.000.
D & S Plug Corporation: *See*—
DiFazio, Robert, 4,520,887, Cl. 180-68.500.
Daar, Horst; and Alig, Franz, to Siemens Aktiengesellschaft; and Metallgesellschaft Aktiengesellschaft. Method for determining the existence of an optimal interval for rapping the electrodes of an electrostatic precipitator. 4,521,223, Cl. 55-13.000.

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Dabi, Shmuel; Loewrigkeit, Peter; and Van Dyk, Kenneth A. Aqueous N-methylolhydrazide-containing polymer dispersion. 4,521,460, Cl. 427-385.500.

Dahmen, Jan E.; Magnusson, Hans G.; and Martensson, Kaj B., to Svenska Sockerfabriks AB. Compounds for therapeutic or diagnostic use, a process and intermediates for their preparation. 4,521,592, Cl. 536-4.100.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Fujita, Takeshi;; Mori, Shigeo; Kataoka, Hironori; and Taniuchi, Akira, 4,521,586, Cl. 528-297.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Sato, Yoshihiro, 4,520,927, Cl. 206-387.000.

Daicel Chemical Industries, Ltd.: *See*—
Ishido, Takatsugu; and Horikawa, Takeshi, 4,521,571, Cl. 525-437.000.
Kanematu, Tetuo, 4,521,594, Cl. 536-98.000.
Otake, Etsuo; Kimura, Mamoru; Yokota, Hiromu; and Kanematu, Tetuo, 4,521,251, Cl. 106-183.000.
Toaba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, 4,521,565, Cl. 525-64.000.
Watanabe, Shoji; Inoue, Kimio; and Okitsu, Kiyoshi, 4,521,570, Cl. 525-415.000.

Daigle, Ronald H., to Rosenberg, Wilbert, a part interest. Convertible headband construction. 4,520,510, Cl. 2-452.000.

Daikin Kogyo Co., Ltd.: *See*—
Nakagawa, Shinichi; and Ihara, Kiyohiko, 4,521,575, Cl. 526-206.000.
Yoshimura, Tatsushiro; and Tominaga, Shigetake, 4,521,596, Cl. 524-406.000.

Daikoku, Takahiro: *See*—
Nakajima, Tadakatsu; Nakayama, Wataru; and Daikoku, Takahiro, 4,520,866, Cl. 165-115.000.

Daimler-Benz Aktiengesellschaft: *See*—
Andres, Rudolf; Grantz, Helmut; Munzel, Wolf-Dietrich; and Odebrecht, Wolfgang, 4,520,863, Cl. 165-48.00R.
Dudeck, Ingo; and Schenk, Jurgen, 4,521,769, Cl. 340-635.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Ono, Yoshio; and Sakamoto, Seiya, 4,521,814, Cl. 358-296.000.
Suzuki, Shigeyoshi; Yamada, Jun; Senga, Takao; Kuriu, Sadao; Yamasaki, Masahiro; Hirose, Iwao; and Maegawa, Tokubee, 4,521,101, Cl. 355-10.000.

Daiwa Seiko Inc.: *See*—
Nagata, Hiromitsu, 4,520,971, Cl. 242-220.000.

Dangel, Henry. Inter-axle differential transfer box unit for a four-wheel drive vehicle. 4,520,690, Cl. 74-695.000.

Dankwart, Franz J.: *See*—
Freitag, Lutz; Wendt, Michael; and Dankwart, Franz J., 4,520,812, Cl. 128-204.250.

Dapkus, P. Danial: *See*—
Liu, Yet-Zen; Hong, Chi-Shain; and Dapkus, P. Danial, 4,521,887, Cl. 372-45.000.

Darda, Walter, to Heidelberger Druckmaschinen AG. Braking brushes in folding apparatus of rotary printing machines. 4,521,007, Cl. 270-47.000.

Darle, Thierry: *See*—
Goursat, Albert-Gilbert; Vernet, Gilles; Rimbert, Jean-Francis; Foulard, Jean; Darle, Thierry; and Bigot, Jean, 4,521,244, Cl. 75-0.50B.

Darnell, Raymond E. Method for fabricating a ball joint assembly including a step for burr removal. 4,520,546, Cl. 29-441.00R.

Das, Jagabandhu, to E. R. Squibb & Sons, Inc. Tetrahydrofuranyl substituted ethers. 4,521,539, Cl. 514-461.000.

Databar Corporation: *See*—
Winter, Arthur J., 4,521,678, Cl. 235-472.000.

D'Augustine, Frank T., to RCA Corporation. Method for reducing degradation of an optical image in an exposure lighthouse. 4,521,501, Cl. 430-24.000.

Daventry Pty. Ltd.: *See*—
Howard, Robert, 4,520,584, Cl. 40-606.000.

Davies, David G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Double base propellant compositions. 4,521,261, Cl. 149-92.000.

Davies, Robert B., to Motorola, Inc. Crossunder within an active device. 4,521,799, Cl. 357-51.000.

Davio, Franklin J.: *See*—
Rasmussen, Donald O.; Chow, William C.; and Davio, Franklin J., 4,520,970, Cl. 242-195.000.

Davis, Boyce W. Seed delinter. 4,520,529, Cl. 19-41.000.

Davis, Kurtis D. Shear pin hilt for knife. 4,520,566, Cl. 30-342.000.

Davis, Walter L.; Messenger, Dale; and Randall, Malcolm W., to Key Technology, Inc. Inspection and cutting apparatus. 4,520,702, Cl. 83-71.000.

Davy McKee (Poole) Limited: *See*—
Ross, Hugh M.; and Grocock, Peter G., 4,520,645, Cl. 72-250.000.

Dawans, Francois: *See*—
Candau, Francoise; Leong, Yee-Sing; Kohler, Norbert; and Dawans, Francois, 4,521,317, Cl. 252-8.55D.

Dawson, Paul H.: *See*—
Sturges, Robert H., Jr.; Birss, Joseph J.; Dawson, Paul H.; and Byford, Roger G., 4,521,844, Cl. 364-167.000.

Day, Gene F., to Xerox Corporation. Ion projection printer with pseudo-continuous back electrode. 4,521,791, Cl. 346-159.000.

Day, Gene F.: *See*—
Clark, Lloyd D.; Wilcox, Jean K.; and Day, Gene F., 4,521,792, Cl. 346-159.000.

Day, John T., to Rubber Millers, Inc. Mechanically raked bar screen with conveyor system having elastomeric rakes. 4,521,306, Cl. 210-159.000.

Dayco Corporation: *See*—
Tassone, Joseph V., 4,521,362, Cl. 264-136.000.

Daymarc Corporation: *See*—
Evain, Jean, 4,520,931, Cl. 209-542.000.

De Cloet Ltd.: *See*—
De Cloet, Dan; De Cloet, Ben; and Krempa, Ted, 4,520,579, Cl. 34-204.000.

Deal, Troy M. Rotating self-cleaning screen. 4,521,305, Cl. 210-158.000.

Debeneix, Pierre, to S.N.E.C.M.A. Combined fastening device for transporting and hoisting a turbojet engine. 4,520,974, Cl. 244-54.000.

de Boer, Peter, to Gispen+Staalmeubel B.V. Chair. 4,521,053, Cl. 297-312.000.

Debrunner, Paul E., Jr., to Rockwell International Corporation. Flow control valve. 4,520,843, Cl. 137-469.000.

Deckler, Harry C., to White Farm Equipment Company. Marker for tilling implements. 4,520,875, Cl. 172-126.000.

De Cloet, Ben: *See*—
De Cloet, Dan; De Cloet, Ben; and Krempa, Ted, 4,520,579, Cl. 34-204.000.

De Cloet, Dan; De Cloet, Ben; and Krempa, Ted, to De Cloet Ltd. Tobacco bin. 4,520,579, Cl. 34-204.000.

DeCoene, Frans J. G. C., to Sperry Corporation. Round baler with vertically oriented start chamber. 4,520,721, Cl. 100-88.000.

Deconinck, Didier, to Allibert S.A. Chaise lounge. 4,521,054, Cl. 297-357.000.

Decorative Designs, Inc.: *See*—
Chapman, G. Paul, 4,521,464, Cl. 428-33.000.

Deep Rock Manufacturing Company, Inc.: *See*—
MacElvain, Robert C., 4,520,879, Cl. 173-57.000.

Deforeit, Christian J., to Matth. Hohner AG. Electronic musical instrument. 4,520,706, Cl. 84-1.100.

de Greef, Magdel N.; and Smit, Ian D. Anaesthetic induction device. 4,520,809, Cl. 128-200.240.

Degussa Aktiengesellschaft: *See*—
Arntz, Dietrich; Prescher, Gunter; Burkhardt, Werner; Heilos, Johannes; and Manner, Reinhard, 4,521,618, Cl. 562-535.000.

deHertel Eastcott, Peter; and Trussler, Ronald C., to Canadian General Electric Company Limited. Grinding mill control using controlled pulsing of air clutches. 4,520,910, Cl. 192-0.02R.

de Jong, Koenraad A.: *See*—
Philips, Franciscus M.; and de Jong, Koenraad A., 4,520,999, Cl. 254-278.000.

Delage, Richard A. Fuel fume generator kit. 4,521,181, Cl. 431-207.000.

De Lima Castro Netto, Eduardo. Sliding closure assemblies. 4,520,534, Cl. 24-399.000.

Delp, Helen R.: *See*—
Benin, Joshua; Delp, Helen R.; and Krauss, Leland L., 4,521,263, Cl. 156-159.000.

Demizu, Hiromi: *See*—
Sakai, Katsuo; and Demizu, Hiromi, 4,521,502, Cl. 430-42.000.

Demus, Dietrich; Vorbrodt, Hans-Matthias; Hauser, Anton; Vogel, Jorg; and Zaschke, Horst, to VEB Werk fur Fernsehelektronik im VEB Kombinat Mikroelektronik. Nematic liquid crystals and method for production thereof. 4,521,327, Cl. 252-299.610.

Denker, Stanley D.: *See*—
Engler, Peter B.; and Denker, Stanley D., 4,520,615, Cl. 53-550.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Asai, Shinichiro; Katoh, Kazuo; and Nakano, Tatsuo, 4,521,476, Cl. 428-209.000.

Dennis, Philip J.: *See*—
Carbone, Douglas C.; and Dennis, Philip J., 4,521,760, Cl. 337-368.000.

Deters, Thomas J. Waste flushing unit for hog farrowing. 4,520,759, Cl. 119-28.000.

Detienne, Jean-Louis; Levesque, Guy; and Tozzolino, Pierre, to Societe Nationale Elf Aquitaine (Production). Process of production of organic dithio-acids and their application. 4,521,301, Cl. 209-166.000.

Deutsch Company, Electronic Components Division, The: *See*—
Kempe, Hans I., 4,521,066, Cl. 339-89.00M.

Deutsche Babcock Werke Aktiengesellschaft: *See*—
Martin, Heino, 4,520,762, Cl. 122-406.0ST.

DeWald, Jack J. Sub-surface safety gate valve. 4,520,994, Cl. 251-58.000.

De Witt, Paolo; and Benedetto, Enrico. Electrolytic process for the preparation of organic compounds. 4,521,285, Cl. 204-72.000.

Deysson, Jean-Yves: *See*—
Bonnot, Guy; Laviolette, Pierre; Potiron, Andre; and Deysson, Jean-Yves, 4,521,353, Cl. 264-8.000.

Dibrell, Edwin W., to Centrifugal Piston Expander, Inc. Method and apparatus for extracting heat and mechanical energy from a pressured gas. 4,520,632, Cl. 62-403.000.

DiCicco, Paolo S. Apparatus for processing articles in a series of process solution containers. 4,520,834, Cl. 134-63.000.

Dien, Sam. Golf club cover. 4,520,855, Cl. 150-52.00G.

Diener, Herbert, to Guhring, Gottlieb. Automatic machine tool. 4,520,595, Cl. 51-3.000.

Diesinger, Walter; and Homburg, Axel, to Dynamit Nobel Aktiengesellschaft. Spin-stabilized training missile. 4,520,972, Cl. 244-3.100.

DiFazio, Robert, to D & S Plug Corporation. Battery holddown arrangement. 4,520,887, Cl. 180-68.500.

DiGeorge, Michael A. Double-locking ratchet for orthopedic brace. 4,520,804, Cl. 128-80.00C.
Digh, Frank, to Harsco Corporation. Concrete core-wall form and stripping assembly therefor. 4,520,989, Cl. 249-13.000.
Dilling, Peter, to Westvaco Corporation. Process for preparing lignosulfonates. 4,521,336, Cl. 530-501.000.
Di Martini, Carl R.; Howe, Herbert E.; Scott, William L.; and Bulvanoski, Leo J., to ASARCO Incorporated. Low temperature, non-SO_2 polluting, kettle process for separation of lead from lead sulfide-containing material. 4,521,247, Cl. 75-77.000.
Dimpel, William L.: *See*—
Blanton, William A., Jr.; and Dimpel, William L., 4,521,389, Cl. 423-235.000.
Dingwall, Andrew G. F., to RCA Corporation. High speed sense amplifier. 4,521,703, Cl. 307-530.000.
Disque, Donny R.: *See*—
Hilker, G. Daniel; Lausen, Verne H.; Coon, Jessie H.; Bodette, James E.; Grimes, Jerry L.; Wright, Roger D.; Disque, Donny R.; and Bultemeier, Keith D., 4,521,173, Cl. 425-113.000.
Disston, Horace C.; and Eichfeld, Timothy J. Foldable ladder. 4,520,896, Cl. 182-22.000.
Diversey Wyandotte Inc.: *See*—
Anderson, Patricia A.; Hagens, Roger G.; and Roden, Dianne M., 4,521,321, Cl. 252-49.300.
Dix, Gary L.; Heim, Lloyd S.; Herald, Robert F.; and Quinlan, William P., to International Business Machines Corporation. Method and apparatus for error data feedback in a diskette drive. 4,521,884, Cl. 371-15.000.
Dix, Johannes P.: *See*—
Armbrust, Herbert; Dix, Johannes P.; Hansen, Guenter; and Zeidler, Georg, 4,521,216, Cl. 8-639.000.
Dix, Robert M.; Ellis, Timothy A.; and Andrews, Gary W., to Texas Instruments Incorporated. Drive mechanism for a refrigerator with clearance seals. 4,520,629, Cl. 62-6.000.
Dixon, Claude E. Video game table for airlines commercial vehicles or the like. 4,521,021, Cl. 273-148.00B.
Dixon Industries Corporation: *See*—
Marshall, Charles R., 4,521,027, Cl. 277-152.000.
Dixon, Robert W., to Chas. M. Bailey Co., Inc. Valve. 4,520,846, Cl. 137-625.300.
Dobbs, Joseph M.: *See*—
Simms, Douglas P.; and Dobbs, Joseph M., 4,521,239, Cl. 71-27.000.
Doboy Packaging Machinery, Inc.: *See*—
Engler, Peter B.; and Denker, Stanley D., 4,520,615, Cl. 53-550.000.
Dr.-Ing. Rudolf Hell GmbH: *See*—
Knop, Hans-Georg, 4,521,812, Cl. 358-287.000.
Dr. Johannes Heidenhain GmbH: *See*—
Schwefel, Ernst, 4,521,845, Cl. 364-171.000.
Dr. von Ballmoos AG: *See*—
Marthaler, Hans-Peter, 4,520,657, Cl. 73-73.000.
Doddrell, David M.: *See*—
Pegg, David T.; Doddrell, David M.; and Bendall, Max R., 4,521,732, Cl. 324-300.000.
Dodge, Cleveland E., Jr. Bypassing double action rope grip. 4,521,000, Cl. 254-391.000.
Doduco KG Dr. Eugen Durrwachter: *See*—
Gevatter, Hans-Jurgen; Muller, Bernhard; and Neese, Hans-Joachim, 4,521,257, Cl. 148-11.50Q.
Doescher, George C.; and Clark, Jim W. Jig. 4,521,140, Cl. 408-97.000.
Dofel, Andrew W. R., to Supafit Gymnasium Equipment Pty. Ltd. Resilient type exercising device. 4,521,013, Cl. 272-136.000.
Doi, Hachiro; and Yaegashi, Masayuki, to Fuso Keigokin Co., Ltd. Lawn mower. 4,520,619, Cl. 56-320.100.
Doi, Haruo: *See*—
Yamamoto, Minoru; Sakata, Jiro; and Doi, Haruo, 4,521,236, Cl. 65-31.000.
Dollard, Peter M.; and Turin, William, to AT&T Bell Laboratories. Quasi-soft decision decoder for convolutional self-orthogonal codes. 4,521,886, Cl. 371-43.000.
Dollhausen, Manfred: *See*—
Kerimis, Dimitrios; Hombach, Rudolf; Muller, Peter; and Dollhausen, Manfred, 4,521,545, Cl. 521-107.000.
Dominguez, Richard J. G.; and Cuscurida, Michael, to Texaco Inc. Polymer polyol prepared by crosslinking a low molecular weight polymer in a polyol. 4,521,581, Cl. 528-57.000.
Domokos, Sipos, to Csepel Muvek Femmuve. Process and equipment for the production of alloyed copper wire rod by continuous casting. 4,521,455, Cl. 427-178.000.
Donaldson Company, Inc.: *See*—
Wolde-Michael, Girma, 4,521,313, Cl. 210-776.000.
Donn Incorporated: *See*—
Worley, Robert F.; and Petras, Jeffrey L., 4,520,609, Cl. 52-729.000.
Doria, Gianfederico; Passarotti, Carlo; Lovisolo, Pier P.; and Buttinoni, Ada, to Farmitalia Carlo Erba S.p.A. Condensed cycloaliphatic derivatives of substituted pyrido[1,2-a]pyrimidines and methods of treating allergic conditions, peptic ulcers and inhibiting gastric acid secretion with them. 4,521,419, Cl. 514-267.000.
Dornier System GmbH: *See*—
Knepper, Udo, 4,521,778, Cl. 343-13.00R.
Doucet, Jos: *See*—
Overbergh, Noel M. M.; Doucet, Jos; and Vansant, Jan, 4,521,470, Cl. 428-36.000.
Douglas, Alan D.; and Reilly, Kenneth T., to GTE Products Corporation. Recovery of rhenium. 4,521,381, Cl. 423-49.000.
Doveri, Carlo, to Piaggio & C. S.p.A. Tension-adjusting device for toothed driving belts subjected to wide temperature differentials. 4,521,208, Cl. 474-101.000.
Dow Chemical Company, The: *See*—
Bubeck, Robert A.; and Arends, Charles B., 4,521,569, Cl. 525-316.000.
Christen, Jimmie D.; and Taylor, Henry B., III, 4,521,548, Cl. 521-167.000.
Kershner, Larry D., 4,521,626, Cl. 564-487.000.
Laursen, Larry J.; and Prueter, Elton D., 4,520,547, Cl. 29-469.500.
Mani, Inder, 4,521,494, Cl. 428-514.000.
Olstowski, Franciszek; and Peffley, Richard D., 4,521,330, Cl. 252-51.50R.
Pedjac, Joseph J., 4,521,633, Cl. 568-639.000.
Dow Corning Limited: *See*—
McVie, James; and Butler, Derek W., 4,521,461, Cl. 427-387.000.
Dowden, Dennis C.: *See*—
Higginbotham, John W.; and Dowden, Dennis C., 4,521,115, Cl. 356-432.000.
Draeger, Brigitte; and Ziegenhorn, Joachim, to Boehringer Mannheim GmbH. Reagent for the precipitation of apo-B-containing lipoproteins. 4,521,519, Cl. 436-17.000.
Draft Systems, Inc.: *See*—
Fallon, Merton R., 4,520,953, Cl. 222-396.000.
Dragerwerk AG: *See*—
Freitag, Lutz; Wendt, Michael; and Dankwart, Franz J., 4,520,812, Cl. 128-204.250.
Drenner, Dewey A., to 4D Incorporated. Brake drum gauge. 4,520,568, Cl. 33-143.00R.
Dresser Industries, Inc.: *See*—
Chen, Robert G.; Patel, Arvind D.; and Sample, Thomas E., Jr., 4,521,578, Cl. 526-288.000.
Kernion, Mark C.; and Renkey, Albert L., 4,521,357, Cl. 264-63.000.
Driggers, Gerald W.: *See*—
Baker, Robert D.; Driggers, Gerald W.; Gray, Ronald W.; and Hawkins, Lawrence A., 4,521,229, Cl. 55-137.000.
Droscher, Michael; Gerth, Christian; and Burzin, Klaus, to Chemische Werke Huels AG. Polybutylene terephthalate molding composition with high cold impact strength and amenable to thermoplastic processing. 4,521,554, Cl. 523-522.000.
Du Pont Canada Inc.: *See*—
Storms, William J., 4,521,437, Cl. 426-130.000.
Dubuit, Jean-Louis: *See*—
Rouly, Eric; Baquet, Philippe; and Dubuit, Jean-Louis, 4,520,726, Cl. 101-123.000.
Dudeck, Ingo; and Schenk, Jurgen, to Daimler-Benz Aktiengesellschaft. Device for detecting the failure of a sensor. 4,521,769, Cl. 340-635.000.
Duffner, Paul: *See*—
Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Ohlinger, Manfred; Wilfinger, Hans J.; Pfannebecker, Emil; and Duffner, Paul, 4,521,527, Cl. 502-184.000.
DuFresne, Allen J., to Paper Converting Machine Company. Apparatus and method for transverse folding of webs. 4,521,209, Cl. 493-432.000.
Dufresne, Raymond A. Non-conductive battery cable connector and electrically conductive clip for use therewith. 4,521,067, Cl. 339-237.000.
Dumas, Glen A.: *See*—
Ziehm, Richard T.; Wilczek, Stephen P.; Baker, George E.; Husted, Raymond R.; Dumas, Glen A.; Bunker, Keith G.; and Place, George H., Jr., 4,521,847, Cl. 364-184.000.
Duncan, Robert, to Westinghouse Electric Corp. Fuel grid with sleeves welded in notched grid straps. 4,521,374, Cl. 376-462.000.
Dunn, James M., to Verex Laboratories, Inc. Constant release rate solid oral dosage formulations of quinidine. 4,521,401, Cl. 424-19.000.
Dunn, James M., to Verex Laboratories, Inc. Constant release rate solid oral dosage formulations of hydrazine. 4,521,402, Cl. 424-19.000.
Dunn, Jimmy L.; Mayo, George L.; and Romeo, Frank C., to Automated Robotic Systems, Inc. Robot tool changer. 4,520,550, Cl. 29-568.000.
Du Pont de Nemours, E. I., and Company: *See*—
Abbott, Scot D.; and Luddy, Michael A. G., 4,521,521, Cl. 436-517.000.
Benin, Joshua; Delp, Helen R.; and Krauss, Leland L., 4,521,263, Cl. 156-159.000.
Coates, John S., 4,521,531, Cl. 502-242.000.
Geltosky, ohn E., 4,521,510, Cl. 435-7.000.
Hay, James V.; and Sauers, Richard F., 4,521,241, Cl. 71-92.000.
Li, George T. C., 4,521,484, Cl. 428-374.000.
McKenna, James M., 4,521,557, Cl. 524-94.000.
Ostermaier, John J., 4,521,628, Cl. 568-1.000.
Paulson, Charles M., Jr.; and Faulhaber, Mark E., 4,521,111, Cl. 356-367.000.
Siuta, Vincent P.; and Slutsky, Joel, 4,521,329, Cl. 252-512.000.
Dupuis, Claude R.; and Hinz, Lorne C., to Northern Telecom Limited. Apparatus for transmitting informaticn via telephone lines. 4,521,643, Cl. 179-2.0DP.
Durand, John E. Visually and mechanically testable submersible composite. 4,521,652, Cl. 200-84.00B.
Durand, Michel: *See*—
Mouille , Bernhard; and Durand, Michel, 4,521,390, Cl. 423-239.000.

Durant, Graham J.: *See*—
Brown, Thomas H.; and Durant, Graham J., 4,521,418, Cl. 514-272.000.

Dusza, John P.; Tomcufcik, Andrew S.; and Albright, Jay D., to American Cyanamid Company. Aryl and heteroaryl[7-(aryl and heteroaryl)pyrazolo[1,5-a]pyrimidin-3-yl]methanones. 4,521,422, Cl. 514-258.000.

Dwinell, Davis B., to American Flange & Manufacturing Co. Inc. Container closure having a frangible outer cap. 4,520,942, Cl. 220-257.000.

Dycem Limited: *See*—
Fitton, Paul; and Holland, Peter J., 4,521,553, Cl. 523-333.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Diesinger, Walter; and Homburg, Axel, 4,520,972, Cl. 244-3.100.

E.D.T. Electrostatic Deposition Technologies S.p.A.: *See*—
Gange, Lester; and Pannell, Reginald J. H., 4,520,754, Cl. 118-626.000.

E. R. Squibb & Sons, Inc.: *See*—
Das, Jagabandhu, 4,521,539, Cl. 514-461.000.

Eagles, Brian A.; and French, Albert G., to Coal Industry (Patents) Limited. Rotary cutter heads for mining machines. 4,521,058, Cl. 299-81.000.

Eastman Kodak Company: *See*—
Adams, L. Jane, 4,521,556, Cl. 524-88.000.
Holzhauser, Ronald C.; McGlen, James A.; and Lawniczak, Gary P., 4,520,977, Cl. 248-201.000.
Lambeth, David N., 4,521,106, Cl. 356-1.000.
Thomsen, Joelle R.; and Fagerburg, David R., 4,521,585, Cl. 528-271.000.

Eaton Corporation: *See*—
Forsell, Kenneth A., 4,521,756, Cl. 335-21.000.
Hastings, Jerome K.; Bigelow, James H.; and Pearson, Robert L., 4,521,757, Cl. 335-79.000.
Ryczek, Lawrence J.; and Janutka, William J., 4,521,694, Cl. 307-266.000.
Ryczek, Lawrence J.; and Janutka, William J., 4,521,748, Cl. 331-108.00D.

Eberhardt, Wolfgang; Hoffmann, Dietrich; Kriechbaum, Karl; and Rohde, Erwin, to Licentia Patent-Verwaltungs-G.m.b.H. High voltage disconnect switch employing pre-contact pieces. 4,521,654, Cl. 200-146.00R.

Eberle, David N.: *See*—
Sobolewski, Robert; and Eberle, David N., 4,520,861, Cl. 164-473.000.

Ebner, Jerry R.: *See*—
Kuechler, Thomas C.; Ebner, Jerry R.; and Li, Tao P., 4,521,395, Cl. 423-376.000.

Eccles, Richard M.: *See*—
Chervenak, Michael C.; Eccles, Richard M.; and Nongbri, Govanon, 4,521,295, Cl. 208-59.000.

Ecker, Harold; and Spencer, Harvey J., to Paper Converting Machine Company. Method of operating a printing press and apparatus. 4,520,728, Cl. 101-248.000.

Eckert, Hermann F.: *See*—
Mason, Joe; and Eckert, Hermann F., 4,521,366, Cl. 264-312.000.

Economy, James; and Zachariades, Anagnostis E., to International Business Machines Corporation. Surface finishing process. 4,520,647, Cl. 72-365.000.

Edelmann, Gilbert, to Cebal. Presetting process for printing cylindrical or conical articles. 4,520,730, Cl. 101-426.000.

Edelstein, William A.: *See*—
Bottomley, Paul A.; and Edelstein, William A., 4,521,733, Cl. 324-309.000.

Edvardsen, Erik, to NAD Holding Limited. Amplifier power supply with large dynamic headroom. 4,521,742, Cl. 330-289.000.

Edwards, Bryant; Klygis, M. Julius; and Olsen, Robert C., to Illinois Tool Works Inc. Multi-package and packaging device. 4,520,924, Cl. 206-150.000.

Eguchi, Ronald G.: *See*—
Naik, Ishverlal K.; and Eguchi, Ronald G., 4,521,443, Cl. 427-38.000.

Eguchi, Yasukata; Hanyu, Susumu; Takenoya, Hideaki; and Inamori, Mikio, to Janome Sewing Machine Co. Ltd. Structure of supporting a stepping motor. 4,520,987, Cl. 248-635.000.

Ehrnford, Lars E. M., to Austenal International, Inc. Condensing instrument for packing and condensing in connection with placement of dental composite resin restorative materials. 4,521,191, Cl. 433-164.000.

Eichfeld, Timothy J.: *See*—
Disston, Horace C.; and Eichfeld, Timothy J., 4,520,896, Cl. 182-22.000.

Eide, Daniel L., to RCA Corporation. Shaft seal. 4,521,026, Cl. 277-134.000.

Eitzinger, Robert, to Mid-West Automation Inc. Reciprocating rectilinear motion apparatus. 4,520,682, Cl. 74-40.000.

Eldridge, Gordon E.: *See*—
Owens, Ester L., 4,520,655, Cl. 73-46.000.

Eldridge, Jerome M.; and Homola, Andrew M., to International Business Machines Corporation. Encapsulated magnetic recording disk. 4,521,451, Cl. 427-130.000.

Electricite de France (Service National): *See*—
Bordet, Rene , 4,520,600, Cl. 52-83.000.

Eli Lilly and Company: *See*—
Foreman, Mark M., 4,521,421, Cl. 514-267.000.
Spry, Douglas O.; and Spitzer, Wayne A., 4,521,598, Cl. 544-16.000.

Elleman, Daniel D.: *See*—
Rhim, Won-Kyu; Saffren, Melvin M.; and Elleman, Daniel D., 4,521,854, Cl. 364-400.000.

Elliott, Francis J. J., Jr. Drum and cymbals pedals assembly. 4,520,710, Cl. 84-422.00R.

Elliott, Richard E.; and King, William R. Particle form evaporation of polymer-liquid mixtures. 4,521,590, Cl. 528-502.000.

Elliott, Robert E. High pressure valve for positive pressure pumps including means for installing and removing the valve. 4,520,842, Cl. 137-327.000.

Elliott, Ross W.: *See*—
Porter, Michael R.; and Elliott, Ross W., 4,521,669, Cl. 219-125.110.

Ellis, Timothy A.: *See*—
Dix, Robert M.; Ellis, Timothy A.; and Andrews, Gary W., 4,520,629, Cl. 62-6.000.

Elsec Electronic Security Systems Ltd.: *See*—
Haran, Ilan; and Haran, Dan, 4,521,768, Cl. 340-566.000.

Elsing, John W.; Gorham, Gene F.; and Knopp, Steven D., to Magnetic Peripherals Inc. Cartridge load mechanism. 4,521,819, Cl. 360-97.000.

Emhart Industries, Inc.: *See*—
Marcinek, John A., 4,521,369, Cl. 264-532.000.
Shedigian, Vandos; and Voyles, Gerald A., 4,521,826, Cl. 361-314.000.

Empak Inc.: *See*—
Johnson, Douglas M., 4,520,925, Cl. 206-334.000.

EMPI, Inc.: *See*—
Wright, Thomas C.; and Ober, Stephen H., 4,520,827, Cl. 128-423.00W.

Encon Products, Inc.: *See*—
Simpson, Harold G.; and Neyer, Leo E., 4,520,610, Cl. 52-745.000.

Endo, Hideo: *See*—
Hayashi, Mitsuji; Endo, Hideo; Oishibashi, Hirotsugu; Aichi, Takeo; and Sasaki, Shigeru, 4,520,756, Cl. 118-699.000.

Endoh, Hiroyuki: *See*—
Sasaki, Tohru; Endoh, Hiroyuki; and Ohira, Seiichi, 4,521,483, Cl. 428-373.000.

Energy Conversion Devices, Inc.: *See*—
Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., 4,520,757, Cl. 118-723.000.

Energy Sciences, Inc.: *See*—
Nablo, Sam V.; and Tripp, Edwin P., III, 4,521,445, Cl. 427-44.000.

Engeler, William E.: *See*—
Mazin, Moshe; and Engeler, William E., 4,521,695, Cl. 307-279.000.

Engelhardt, Friedrich; Schmitz, Hermann; Gulden, Walter; and Hax, Jorg, to Cassella Aktiengesellschaft. High molecular weight water-soluble polymers useful in deoiling sand and rock masses. 4,521,579, Cl. 526-287.000.

Engelke, Claude W.; Sutton, Gerald E.; and Potter, Steven E., to Boeing Company, The. Method and mold for fabricating an aerodynamic airframe structure. 4,521,354, Cl. 264-46.600.

Engler, Peter B.; and Denker, Stanley D., to Doboy Packaging Machinery, Inc. Tube forming apparatus for packaging. 4,520,615, Cl. 53-550.000.

Englund, Michael S.; Hafele, Joseph C.; and Schulze, Dwain C., Jr., to Caterpillar Tractor Co. System for obtaining exhaust samples and analyzing the same. 4,520,652, Cl. 73-23.000.

Enichimica S.p.A.: *See*—
Romano, Ugo; Renzi, Fiorenzo; Rivetti, Franco; and Gagliardi, Claudio, 4,521,577, Cl. 526-261.000.

Enomoto, Yoichi: *See*—
Murakami, Toshiaki; Enomoto, Yoichi; and Inamura, Takahiro, 4,521,682, Cl. 250-211.00J.

ENSCO, Inc.: *See*—
Carbeau, Richard W.; Martin, James F.; Lanier, John H.; and Holt, William L., 4,520,741, Cl. 110-344.000.

Enzyme Technology Company: *See*—
Stout, Robert L., 4,521,511, Cl. 435-28.000.

Erdman, Timothy R., to Chevron Research Company. Dispersant lubricating oil additives. 4,521,319, Cl. 252-47.500.

Ergenics Inc.: *See*—
Lynch, Franklin E.; and Baker, Nathaniel R., 4,520,763, Cl. 123-1.00A.

Erickson, Donald C., to Air Products and Chemicals, Inc. Controlled temperature expansion in oxygen production by molten alkali metal salts. 4,521,398, Cl. 423-579.000.

Eriksson, Sven: *See*—
Lundin, Per O.; Eriksson, Sven; and Lundin, Ingvar, 4,521,314, Cl. 210-777.000.

Erlacher, Richard F.: *See*—
McCartney, Michael S.; Chadshay, Roman; and Erlacher, Richard F., 4,520,739, Cl. 110-263.000.

Eschrich, Gerhard; and Schwab, Manfred, to Robert Bosch GmbH. Method of controlling engine operation in an automotive vehicle during gear change. 4,520,694, Cl. 74-858.000.

Eshet Eilon: *See*—
Gefen, Nir, 4,520,873, Cl. 172-47.000.

Eshkol, Aliza: *See*—
Pelham, Russell W.; Redden, Charlotte S.; Eshkol, Aliza; and Stiles, Gerald E., 4,521,407, Cl. 424-95.000.

Eskinazi, Victoria: *See*—
Wells, James E.; and Eskinazi, Victoria, 4,521,600, Cl. 544-352.000.

Essential Automotive Products, Inc.: *See*—
Juskevic, John, 4,521,142, Cl. 409-82.000.

Essex Group, Inc.: *See*—
Vogel, Ralph A., 4,521,363, Cl. 264-174.000.

Essilor International (Compagnie Generale d'Optique): *See*—
Pierquin, Jean-Claude, 4,521,090, Cl. 351-124.000.
Estes, William E., to Stauffer Chemical Company. Method to improve yields of sodium hypophosphite. 4,521,391, Cl. 423-307.000.
Estriplet, Isnard: *See*—
Macko, Joseph E.; and Estriplet, Isnard, 4,520,677, Cl. 73-861.000.
Etat Francais: *See*—
Saint-Michel, Jacques A.; Chabrerie, Jean-Pierre; and Mailfert, Alain, 4,521,709, Cl. 310-186.000.
Ethicon, Inc.: *See*—
Menezes, Edgar V.; and Steinheuser, Peter, 4,520,822, Cl. 128-335.500.
Ethyl Corporation: *See*—
Jackisch, Philip F., 4,521,624, Cl. 564-446.000.
Perilstein, Warren L., 4,521,219, Cl. 44-55.000.
Stahly, G. Patrick, 4,521,345, Cl. 260-465.00F.
Eucken, Craig M., to Teledyne Industries, Inc. Nitrogen annealing of zirconium and zirconium alloys. 4,521,259, Cl. 148-20.300.
Eumuco Aktiengesellschaft Fur Maschinenbau: *See*—
Werner, Eberhard; and Willim, Friedrich, 4,520,643, Cl. 72-39.000.
Eurobeva Engineering Trust: *See*—
Claudio, Fuzzi, 4,520,613, Cl. 53-441.000.
Evain, Jean, to Daymarc Corporation. Apparatus for reorienting electrically asymmetrical axial lead devices in a sorter/tester. 4,520,931, Cl. 209-542.000.
Eveland, Michael: *See*—
Cushman, Robert L.; Koester, Arlan; and Eveland, Michael, 4,520,960, Cl. 239-29.000.
Ex-Cell-O Corporation: *See*—
Lisiecki, Robert E., 4,520,929, Cl. 206-610.000.
Lisiecki, Robert E., 4,520,930, Cl. 206-628.000.
Lisiecki, Robert E., 4,520,957, Cl. 229-17.00R.
Exxon Research & Engineering Co.: *See*—
Hicks, Alfonza; and Hankins, Jerry E., 4,521,303, Cl. 209-454.000.
Tsien, Hsue C., 4,521,359, Cl. 264-104.000.
Turner, S. Richard; Siano, Donald B.; and Bock, Jan, 4,521,580, Cl. 526-307.200.
Fabricant, Barbara L.: *See*—
Aubourg, Patrick F.; and Fabricant, Barbara L., 4,521,523, Cl. 501-30.000.
Fabrique de Produits Chimiques, d'Entretien et de Degraissage Ravicolor, S.A.: *See*—
Hueber, Francois, 4,520,961, Cl. 239-284.00R.
Facey, Roy B., to CRC Chemicals Inc. Aerosol cap. 4,520,951, Cl. 222-182.000.
Fachini, Robert M.; Barrett, Monroe C.; and McClure, Maxwell D., III, to J. I. Case Company. Cotton harvester. 4,520,617, Cl. 56-16.600.
Facoetti, Hugues: *See*—
Broussoux, Dominique; Facoetti, Hugues; Micheron, Francois; and Monnerie, Lucien, 4,521,322, Cl. 252-62.900.
Fagerburg, David R.: *See*—
Thomsen, Joelle R.; and Fagerburg, David R., 4,521,585, Cl. 528-271.000.
Falciai, Riccardo: *See*—
Sottini, Stefano; Brenci, Massimo; Righini, Giancarlo; Falciai, Riccardo; Russo, Vera; and Scheggi, Verga A., 4,521,070, Cl. 350-96.150.
Falconer, Robert M., to British Telecommunications. Interactive non-hierarchical adaptively synchronized oscillator network and phase locked loop oscillator for use therein. 4,521,745, Cl. 331-2.000.
Falk, Richard A. Repeating thermocouple. 4,521,639, Cl. 136-234.000.
Fallon, Merton R., to Draft Systems, Inc. Safety apparatus for high pressure systems. 4,520,953, Cl. 222-396.000.
Fann, James D. Insert for blocking operation of the disc write switch in use of computer diskettes. 4,521,820, Cl. 360-133.000.
Fanning, William J., to AT&T Technologies, Inc. Component module for piggyback mounting on a circuit package having dual-in-line leads. 4,521,828, Cl. 361-386.000.
Fanuc Ltd.: *See*—
Kinoshita, Mitsuo; and Obara, Haruki, 4,521,662, Cl. 219-69.00W.
Kinoshita, Mitsuo, 4,521,721, Cl. 318-573.000.
Sakamoto, Keiji; and Toyozawa, Yukio, 4,521,724, Cl. 318-762.000.
Fapiano, Donald J., to General Electric Company. Method of improved gage control in metal rolling mills. 4,521,859, Cl. 364-472.000.
Farmitalia Carlo Erba S.p.A.: *See*—
Doria, Gianfederico; Passarotti, Carlo; Lovisolo, Pier P.; and Buttinoni, Ada, 4,521,419, Cl. 514-267.000.
Fatello, Ubaldo. Surfboard type boat convertible into sailboat or buoy. 4,521,200, Cl. 440-23.000.
Faulhaber, Mark E.: *See*—
Paulson, Charles M., Jr.; and Faulhaber, Mark E., 4,521,111, Cl. 356-367.000.
Faulkenberry, Wayne J.: *See*—
Franke, Earnest A.; and Faulkenberry, Wayne J., 4,521,912, Cl. 455-115.000.
Faulkner, Richard D.; and McDonie, Arthur F., to RCA Corporation. Photoemissive cathode formed on conductive strips. 4,521,715, Cl. 313-531.000.
Ferrante, Mario, to Photomeca S.A. Developing light sensitive plates including use of ultrasonic waves. 4,521,092, Cl. 354-320.000.
Ferrio, Linda J.: *See*—
Caldwell, David; Ferrio, Linda J.; and Hunter, Arthur C., 4,521,868, Cl. 364-753.000.
Ferris, Ernest A.; and McColl, John W., to Borg-Warner Corporation. Hydraulically actuated starting clutch assembly. 4,520,912, Cl. 192-85.0AA.
Ferro Manufacturing Corporation: *See*—
Fudala, Chester S., 4,521,055, Cl. 297-362.000.
Fickelscher, Kurt G., to Balcke-Duerr AG. Fluid-flow machine. 4,521,158, Cl. 416-160.000.
Field, Keith C., to Matisa (U.K.) Limited. Convertible rail-highway maintenance vehicle. 4,520,735, Cl. 105-215.00C.
Fieldhouse, John W.: *See*—
Maglio, Ralph A.; and Fieldhouse, John W., 4,521,479, Cl. 428-326.000.
Fifolt, Michael J.; and Foster, Arthur M., to Occidental Chemical Corporation. Method for the preparation of fluoroanthranilic acids. 4,521,616, Cl. 562-456.000.
Filliman, Mark D.: *See*—
Granzow, Robert H.; Gupta, Desh B.; Myers, Kimbrough I.; and Filliman, Mark D., 4,521,008, Cl. 271-3.000.
Finike Italiana Marposs S.p.A.: *See*—
Solaroli, Sergio, 4,521,863, Cl. 364-561.000.
Finke, Manfred; and Mundnich, Rainer, to Hoechst Aktiengesellschaft. Phosphorus-containing cyanohydrine derivatives. 4,521,348, Cl. 260-940.000.
Finke, Robert G., to Robert Finke GmbH. Safety screw cap. 4,520,938, Cl. 215-220.000.
Finkelstein, Wolfgang; and Haaz, Josef, to Gebruder Trox, GmbH. Regulator valve for stabilizing volume flow, especially in ventilation systems. 4,520,844, Cl. 137-486.000.
Finkenzeller, Johann; and Mittelstaedt, Wolfgang, to Siemens Aktiengesellschaft. Dental X-ray diagnostic device. 4,521,899, Cl. 378-40.000.
Fiorentino, Robert J., to Battelle Memorial Institute. Methods of compaction by incremental radial compression and/or low-ratio extrusion. 4,521,360, Cl. 264-108.000.
Firestone Tire & Rubber Company, The: *See*—
Maglio, Ralph A.; and Fieldhouse, John W., 4,521,479, Cl. 428-326.000.
Fischer, Detlef: *See*—
Schumann, Henning; Busch, Peter; Fischer, Detlef; and Thiele, Klaus, 4,520,831, Cl. 132-11.00R.
Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Inker for rotary printing machine, and method. 4,520,729, Cl. 101-352.000.
Fischer, Larry E.; and Bean, Jackie E., to General Electric Company. Control of nuclear reactors. 4,521,370, Cl. 376-233.000.
Fischer, Rolf; Weitz, Hans-Martin; and Paust, Joachim, to BASF Aktiengesellschaft. Preparation of 2-alkyl-4,4-diacyloxybut-2-enals. 4,521,342, Cl. 260-410.000.
Fisher, Albert W., to RCA Corporation. Method of making a multilevel metallization structure for semiconductor device. 4,520,554, Cl. 29-591.000.
Fisher, John M.; and Putt, James C., to B.F. Goodrich Company, The. Valve for high pressure fluid container. 4,520,838, Cl. 137-69.000.
Fitton, Paul; and Holland, Peter J., to Dycem Limited. Anti-static highly-plasticized polyvinylchloride. 4,521,553, Cl. 523-333.000.
Fitzgerald-Smith, James P.; Bird, Bertram; and Willis, Michael, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Bridge module for use in a crane assisted method of building a transportable girder bridge. 4,520,523, Cl. 14-2.400.
Flaig, Heinz, to Mannesmann Aktiengesellschaft. Safety mechanism for a hoist. 4,520,998, Cl. 254-267.000.
Flanagan, Eugene L., III, to American Home Products Corporation (Del.). Ultrasonic imaging device. 4,520,830, Cl. 128-660.000.
Flanders Filters,Inc.: *See*—
Peebles, William C., Jr.; and Bowers, Cecil W., 4,521,234, Cl. 55-481.000.
Fleissner, Heinz, to Vepa Aktiengesellschaft. Steaming device arranged in front of a synthetic fiber crimping installation for heating fibers traveling past such steaming device. 4,520,637, Cl. 68-5.00D.
Flood, Mark A.: *See*—
Galdun, Daniel J.; Grudowski, Raymond A.; and Flood, Mark A., 4,521,871, Cl. 364-900.000.
Flowers, Dervin L., to Motorola, Inc. Plasma enhanced diffusion process. 4,521,441, Cl. 427-38.000.
FMC Corporation: *See*—
Rodler, Waldo E., Jr., 4,520,691, Cl. 74-790.000.
Sikorski, Charles F., 4,521,316, Cl. 252-8.55R.
Wolf, Marvin L., 4,520,888, Cl. 180-125.000.
Foggini, Giovanni, to Lear S.n.c. di Foggini & C. Cell structure sun visor for automobile vehicles including retention and snap-action positioning means. 4,521,046, Cl. 296-97.00K.
Foot, William R.: *See*—
Hodgson, Thomas D.; and Foot, William R., 4,521,400, Cl. 423-658.500.
Foptica: *See*—
Cholley, Henri E.; Laupretre, Jean J.; and Rollet, Jean, 4,521,072, Cl. 350-96.230.
Ford Aerospace & Communications Corporation: *See*—
Bryans, Lawrence G.; Goudey, Kenneth R.; and Nickerson, William F., 4,521,783, Cl. 343-781.00R.
Lehner, John A.; and Lebsock, Kenneth L., 4,521,855, Cl. 364-434.000.
Ford Motor Company: *See*—
Kaiser, William J., 4,520,653, Cl. 73-23.000.
Foreman, Mark M., to Eli Lilly and Company. Treatment of sexual dysfunction. 4,521,421, Cl. 514-267.000.
Forsberg, Gunnar; and Ingre, Lars, to Telefonaktiebolaget L M Ericsson. Method and an arrangement for increasing the dynamic range at

the input stage of a receiver in an optical fibre information transmission system. 4,521,920, Cl. 455-619.000.
Forsell, Kenneth A., to Eaton Corporation. Circuit breaker having increased contact opening velocity at trip operation. 4,521,756, Cl. 335-21.000.
Foster, Arthur M.: *See*—
Fifolt, Michael J.; and Foster, Arthur M., 4,521,616, Cl. 562-456.000.
Foulard, Jean: *See*—
Goursat, Albert-Gilbert; Vernet, Gilles; Rimbert, Jean-Francis; Foulard, Jean; Darle, Thierry; and Bigot, Jean, 4,521,244, Cl. 75-0.50B.
Fournier, Pascal; and Peraud, Jean-Claude, to Pont-A-Mousson, S.A. Apparatus for rapid solidification of thin metallic strips on a continuously moving substrate. 4,520,859, Cl. 164-253.000.
Fox, Robert L.: *See*—
Buckley, John D.; Swaim, Robert J.; Fox, Robert L.; and Johnston, David F., 4,521,659, Cl. 219-10.770.
Foxboro Company, The: *See*—
Gilby, Anthony C.; Lewis, Edward L.; and Olsen, Everett O., 4,521,684, Cl. 250-227.000.
Koziol, Stanislaw; and Sgourakes, George E., 4,520,678, Cl. 73-861.240.
Frama AG.: *See*—
Haug, Werner, 4,520,725, Cl. 101-91.000.
Francovitch, Thomas F. Roof membrane anchoring systems using dual anchor plates. 4,520,606, Cl. 52-410.000.
Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Ohlinger, Manfred; Wilfinger, Hans J.; Pfannebecker, Emil; and Duffner, Paul, to BASF Aktiengesellschaft. Molded iron catalyst and its preparation. 4,521,527, Cl. 502-184.000.
Franke, Earnest A.; and Faulkenberry, Wayne J., to General Electric Company. Low power indicating circuit for a radio transmitter. 4,521,912, Cl. 455-115.000.
Frankiewicz, Jeffrey R.: *See*—
Lemme, Christopher J.; and Frankiewicz, Jeffrey R., 4,521,516, Cl. 435-253.000.
Frano, Francis G.; and Ruehl, William E., to Illinois Tool Works Inc. Differential-vacuum alarm device. 4,520,748, Cl. 116-70.000.
Franz Kuhlmann Prazisionsmechanik und Maschinenbau GmbH & Co. KG: *See*—
Otten, Heinrich, 4,520,573, Cl. 33-438.000.
Franzischka, Wolfgang: *See*—
Rebafka, Walter; Heilen, Gerd; Halbritter, Klaus; and Franzischka, Wolfgang, 4,521,602, Cl. 546-184.000.
Frater, John S.; and Pope, David W., to Joy Manufacturing Holdings Limited. Centrifugal slurry pump. 4,521,151, Cl. 415-131.000.
Freitag, Lutz; Wendt, Michael; and Dankwart, Franz J., to Drageerwerk AG. Method and apparatus for controlling a pressure level in a respirator. 4,520,812, Cl. 128-204.250.
French, Albert G.: *See*—
Eagles, Brian A.; and French, Albert G., 4,521,058, Cl. 299-81.000.
Frentzel, Richard L., to Olin Corporation. Preparation of carboxylic acid-containing monoether and polyether polyol addition products. 4,521,615, Cl. 560-198.000.
Fricke, Richard J.: *See*—
Kennedy, Richard B., 4,521,544, Cl. 521-107.000.
Friedline, Karl L.: *See*—
Nigborowicz, John J.; and Friedline, Karl L., 4,521,810, Cl. 358-181.000.
Friedmann, Oswald: *See*—
Maucher, Paul; and Friedmann, Oswald, 4,520,913, Cl. 192-48.800.
Frigerio, Marco: *See*—
Nisato, Dino; Frigerio, Marco; and Miranda, Giovanna F., 4,521,428, Cl. 514-277.000.
Frito-Lay, Inc.: *See*—
Berger, Kenneth R., 4,521,467, Cl. 428-35.000.
Fronius, Klaus, to Miller Electric Manufacturing Company. Electronic welding apparatus. 4,521,671, Cl. 219-130.310.
Fronius, Klaus, to Miller Electric Manufacturing Company. Electronic welding apparatus. 4,521,672, Cl. 219-130.330.
Froude Consine Limited: *See*—
Hitchcock, Keith N., 4,520,660, Cl. 73-120.000.
Fuchs, Uwe; and Wildmoser, Alfred, to Linde Aktiengesellschaft. Activated sludge system with integrated regenerator. 4,521,311, Cl. 210-616.000.
Fudala, Chester S., to Ferro Manufacturing Corporation. Power recliner. 4,521,055, Cl. 297-362.000.
Fuji Photo Film Co., Ltd.: *See*—
Arai, Yoshihiro; and Nahara, Akira, 4,521,482, Cl. 428-336.000.
Inukai, Yuzo; and Shichijo, Yoshiaki, 4,520,755, Cl. 118-629.000.
Nagao, Makoto; and Nahara, Akira, 4,521,481, Cl. 428-336.000.
Ohtsuka, Shuichi; Aotsuka, Yasuo; and Saito, Eiichi, 4,521,103, Cl. 355-14.00D.
Sugimoto, Tadao; Ikeda, Hideo; Mifune, Hiroyuki; and Nakamura, Koki, 4,521,508, Cl. 430-567.000.
Takano, Masao, 4,521,904, Cl. 378-185.000.
Takeda, Hideo, 4,521,459, Cl. 427-359.000.
Fuji Xerox Co., Ltd.: *See*—
Suganuma, Saburo; and Kataoka, Hiroyuki, 4,521,096, Cl. 355-3.00R.
Fujie, Masakatsu: *See*—
Yoshida, Takashi; Fujie, Masakatsu; Matsuno, Junichi; and Ouchi, Hideyuki, 4,521,813, Cl. 358-296.000.
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Beane, Bennie J., 4,521,379, Cl. 422-209.000.
Bottomley, Paul A.; and Edelstein, William A., 4,521,733, Cl. 324-309.000.
Case, Allen W., Jr.; and Peroutky, Donald C., 4,521,670, Cl. 219-130.010.
Challen, Richard F., 4,521,918, Cl. 455-343.000.
Fapiano, Donald J., 4,521,859, Cl. 364-472.000.
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Franke, Earnest A.; and Faulkenberry, Wayne J., 4,521,912, Cl. 455-115.000.
Gittinger, Norman C., 4,521,803, Cl. 358-12.000.
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Holt, John R., Jr., 4,521,917, Cl. 455-223.000.
King, Harold B.; Masaitis, William; Ippisch, Ernest; and Chinn, Albert E., 4,521,862, Cl. 364-552.000.
Mazin, Moshe; and Engeler, William E., 4,521,695, Cl. 307-279.000.
Merrill, Duane F., 4,521,471, Cl. 428-40.000.
Morris, Robert A.; Kiesel, George W.; and Rajotte, Paul T., 4,521,824, Cl. 361-45.000.
Pasko, Walter J., Jr.; and Rathbun, William H., 4,520,556, Cl. 29-606.000.
Pritzkow, Dennis H., 4,521,689, Cl. 250-385.000.
Rosenquist, Niles R., 4,521,562, Cl. 524-490.000.
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Terhune, James H., 4,520,654, Cl. 73-24.000.
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Shilling, Norman Z., 4,521,231, Cl. 55-302.000.
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Rajkanan, Kamal; and Multani, Jagir S., 4,521,796, Cl. 357-23.500.
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Calderoni, Sergio L., 4,521,005, Cl. 267-179.000.
Carpenter, Keith H., 4,520,908, Cl. 188-319.000.
Cho, Byong K., 4,521,532, Cl. 502-439.000.
Kisner, Howard D., 4,521,287, Cl. 204-192.0SP.
Kramer, Richard L., 4,520,640, Cl. 70-248.000.
Lindenmuth, Donald C., 4,521,056, Cl. 297-412.000.
Moore, George R.; and Mahannah, Daniel H., 4,520,663, Cl. 73-129.000.
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Ryan, William P.; and Schroeder, Thaddeus, 4,520,658, Cl. 73-117.300.
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Sacca, Demetrio B.; Sanderson, Edward H.; and Beatenbough, Paul K., 4,520,867, Cl. 165-144.000.
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Genma, Hideyuki; and Sugita, Yoshiaki, to Suzuki Motor Company Limited. Small car body. 4,521,049, Cl. 296-185.000.
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Genuit, Luther L.; and Nowell, John R., to Honeywell Information Systems Inc. Motor generator shutdown circuit for extended ride-through. 4,521,692, Cl. 290-4.00A.
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Kessick, Michael A.; George, Zacharia M.; and Schneider, Linda G., 4,521,382, Cl. 423-68.000.
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Gerdes, Donald F.; and Telchuk, Steve E., to Binks Manufacturing Company. Air washer for paint spray booth. 4,521,227, Cl. 55-225.000.
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Gessel, James M.; Kunz, Gary L.; and Scheidenhelm, E. Louis, to Hart-Carter Company. Harvester reel pickup tine. 4,520,620, Cl. 56-400.000.
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Gevatter, Hans-Jurgen; Muller, Bernhard; and Neese, Hans-Joachim, to Doduco KG Dr. Eugen Durrwachter. Process of manufacturing strip coated with precious metal as a semifinished product for making electric contacts. 4,521,257, Cl. 148-11.50Q.
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Gilbert, Barrie W., to Bipel Limited. Moulding machines. 4,521,172, Cl. 425-73.000.
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Morse, Albert I.; Crowell, Douglas H.; and Gilligan, Thomas J., III, 4,520,751, Cl. 118-203.000.
Ginter, Carl A. Quill stop device. 4,521,144, Cl. 409-218.000.
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Gittinger, Norman C., to General Electric Company. System for compatible transmission of high-resolution TV. 4,521,803, Cl. 358-12.000.
Givens, Edwin N.; and Hoover, David S., to International Coal Refining Company. Removal of basic nitrogen compounds from hydrocarbon liquids. 4,521,299, Cl. 208-254.00R.
Glaeser, Christopher D.: *See*—
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Glasson, Richard E.: *See*—
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Glenayre Electronics, Ltd.: *See*—
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Goatcher, John K.: *See*—
Vance, Ian A. W.; and Goatcher, John K., 4,521,892, Cl. 375-88.000.
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Gold, Kenneth A. Fabric and method of manufacture using selvage bands. 4,521,472, Cl. 428-53.000.
Goldhammer, Albert. Safety and warning devices for baling presses. 4,520,722, Cl. 100-99.000.
Golub, Gregory J., to Westinghouse Electric Corp. Operating mechanism for a control device. 4,520,687, Cl. 74-491.000.
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Patterson, Dennis B.; Parker, Dane K.; and Hess, Lloyd D., Jr., 4,521,574, Cl. 526-204.000.

Goossens, Andre F. L.: *See—*
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Gorham, Gene F.: *See—*
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Goth, Paul R.: *See—*
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Goudey, Kenneth R.: *See—*
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Gould, Jerome; and Kellogg, Thomas W., to James River-Norwalk, Inc. Package structure. 4,520,946, Cl. 221-63.000.

Goursat, Albert-Gilbert; Vernet, Gilles; Rimbert, Jean-Francis; Foulard, Jean; Darle, Thierry; and Bigot, Jean, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process of producing metal powders from a molten metal material. 4,521,244, Cl. 75-0.50B.

Goyert, Wilhelm; and Winkler, Jurgen, to Bayer Aktiengesellschaft. Thermoplastic polyurethanes having a high heat stability, based on naphthylene diisocyanate, their production and their use. 4,521,582, Cl. 528-67.000.

Graboplast: *See—*
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Gradl, David A., to Q-Dot, Inc. Passive transient recording systems. 4,521,752, Cl. 333-165.000.

Graf, Fritz: *See—*
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Granzotto, Richard J.: *See—*
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Granzow, Robert H.; Gupta, Desh B.; Myers, Kimbrough I.; and Filliman, Mark D., to NCR Corporation. Fail safe document dispensing system. 4,521,008, Cl. 271-3.000.

Grassetti, Davide R. Agents affecting the production of hormones in living mammals. 4,521,425, Cl. 514-350.000.

Grawey, Charles E., to Caterpillar Tractor Co. Heat exchanger. 4,520,868, Cl. 165-158.000.

Gray, Ronald W.: *See—*
Baker, Robert D.; Driggers, Gerald W.; Gray, Ronald W.; and Hawkins, Lawrence A., 4,521,229, Cl. 55-137.000.

Grebe, Reiner; Norbisrath, Max; and Schmidt, Karl-Heinz, to Kramer & Grebe GmbH & Co. KG. Process and equipment for continuous cutting of material. 4,520,963, Cl. 241-30.000.

Grebenschikov, Anatoly P.: *See—*
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Green, David T., to United States Surgical Corporation. Surgical instruments. 4,520,817, Cl. 128-305.000.

Greenslade, John T.: *See—*
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Greenwald, Edward H., Sr. Process for producing a coal-water mixture. 4,521,218, Cl. 44-51.000.

Grefco, Inc.: *See—*
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Gregorian, Roubik: *See—*
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Gregory Tool Systems, Inc.: *See—*
Gregory, Jack T., 4,520,648, Cl. 72-391.000.

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Windawi, Hassan; Grieger, Gene R.; and Oakdale, Warren R., 4,521,394, Cl. 423-363.000.

Griffey, Donald E., to Zenith Electronics Corporation. Projection TV CRT burn protection. 4,521,720, Cl. 315-386.000.

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Grocock, Peter G.: *See—*
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Grof, Geza J., to James Dole Corporation. Vacuum foam remover. 4,520,528, Cl. 15-304.000.

Grogler, Gerhard; and Kopp, Richard, to Bayer Aktiengesellschaft. Process for the preparation of low molecular weight 4,4'-diphenylmethane-uretdione-diisocyanates. 4,521,338, Cl. 260-239.00A.

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Grove Medical Supply, Inc.: *See—*
White, Daniel S.; and Nave, Jerald L. (said Jerald L. Nave assors. to), 4,520,811, Cl. 128-203.110.

Grudowski, Raymond A.: *See—*
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GTE Automatic Electric Laboratories, Incorporated: *See—*
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Byszewski, Wojciech W.; Budinger, A. Bowman; and Proud, Joseph M., 4,521,718, Cl. 315-99.000.

GTE Products Corporation: *See—*
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Carbone, Douglas C.; and Dennis, Philip J., 4,521,760, Cl. 337-368.000.
Douglas, Alan D.; and Reilly, Kenneth T., 4,521,381, Cl. 423-49.000.
Hsieh, Martin Y., 4,521,525, Cl. 501-98.000.
Snell, Richard G.; and Loughridge, Fredrick A., 4,521,641, Cl. 174-50.640.

Guarnieri, C. Richard, to International Business Machines Corporation. Radiant energy collector having plasma-textured polyimide exposed surface. 4,521,442, Cl. 427-38.000.

Gueldenpfennig, Klaus; Russell, Stanley L.; Oswald, William A.; Breidenstein, Charles J.; and Narula, Karam V. Digital private branch exchange. 4,521,879, Cl. 370-62.000.

Guhring, Gottlieb: *See—*
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Guisinger, Barrett E., to Sony Corporation. One plus double omega squared radio frequency equalizer. 4,521,818, Cl. 360-65.000.

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Meggs, Daniel H.; Gross, Herbert G.; and Greenslade, John T., 4,521,835, Cl. 362-183.000.

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Gunther, Oswin: *See—*
Gotz, Udo; Gleichauf, Winifred; and Gunther, Oswin, 4,520,731, Cl. 102-527.000.

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Granzow, Robert H.; Gupta, Desh B.; Myers, Kimbrough I.; and Filliman, Mark D., 4,521,008, Cl. 271-3.000.

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Bjorklund, Robert; Gustavsson, Hans; Lundstrom, Ingemar; and Nygren, Bertil, 4,521,450, Cl. 427-121.000.

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Schoonmade, Wim, 4,521,134, Cl. 405-198.000.

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Butt, Sheldon H.; Smith, Edward F., III; and Gyurina, F. Dennis, 4,521,469, Cl. 428-35.000.

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Finkelstein, Wolfgang; and Haaz, Josef, 4,520,844, Cl. 137-486.000.

Hadary, Joseph. Toothpick holder. 4,520,833, Cl. 132-90.000.

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Slaminski, J. Michael, 4,520,796, Cl. 126-445.000.

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Englund, Michael S.; Hafele, Joseph C.; and Schulze, Dwain C., Jr., 4,520,652, Cl. 73-23.000.

Hagan, John A.; and Lafferty, James, to Rehrig Pacific Company. Water bottle crate. 4,520,941, Cl. 220-72.000.

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Anderson, Patricia A.; Hagens, Roger G.; and Roden, Dianne M., 4,521,321, Cl. 252-49.300.
Hahn, Daniel G. Exerciser tension device assembly. 4,521,010, Cl. 272-73.000.
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Hall, Charles P. Foldable, insulated solar water heater. 4,520,793, Cl. 126-426.000.
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Cole, Clinton W.; and Beach, Verlin R., 4,520,837, Cl. 137-68.00R.
Murphey, Joseph R., 4,521,136, Cl. 405-263.000.
Halsey, Jay F.; and Briggs, Jeffrey M., to RCA Corporation. Skylight structure. 4,520,604, Cl. 52-200.000.
Halsey Taylor Division of King-Seeley Thermos Co.: *See*—
Cushman, Robert L.; Koester, Arlan; and Eveland, Michael, 4,520,960, Cl. 239-29.000.
Hamada, Hiroyoshi: *See*—
Kuwabara, Yoshiharu; Hamada, Hiroyoshi; and Kuwata, Masayuki, 4,521,112, Cl. 356-375.000.
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Hamanaka, Ernest S.; and Stam, John G., to Pfizer Inc. Salts of 6-alpha-(aminomethyl)penicillanic acid 1,1-dioxide esters and beta-lactam antibiotics. 4,521,533, Cl. 514-80.000.
Hamashima, Eiji: *See*—
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Hammerschmidt, Horst E.: *See*—
Blank, Michael G.; and Hammerschmidt, Horst E., 4,521,177, Cl. 425-533.000.
Hampel, Hans-Joachim; Scondo, Ludwig; Stahl, Jurgen; Wegner, Wilhelm; and Bonne, Harry, to Jacobs Beverage Systems AG. Disposable container for liquids and apparatus for dispensing liquid from such container. 4,520,948, Cl. 222-103.000.
Handleman, Avrom R., to Semi-Bulk Systems, Inc. Apparatus for pumping fluent solid material. 4,521,165, Cl. 417-393.000.
Hankins, Jerry E.: *See*—
Hicks, Alfonza; and Hankins, Jerry E., 4,521,303, Cl. 209-454.000.
Hansen, Guenter: *See*—
Armbrust, Herbert; Dix, Johannes P.; Hansen, Guenter; and Zeidler, Georg, 4,521,216, Cl. 8-639.000.
Hanson, Raymond, to USM Corporation. Applicator nozzle. 4,521,456, Cl. 427-207.100.
Hanyu, Susumu: *See*—
Eguchi, Yasukata; Hanyu, Susumu; Takenoya, Hideaki; and Inamori, Mikio, 4,520,987, Cl. 248-635.000.
Harada, Setsuo; Shinagawa, Susumu; and Kitano, Kazuaki, to Takeda Chemical Industries, Ltd. Pharmaceutically acceptable salts of the antibiotic C-19393 E_5. 4,521,340, Cl. 260-245.20T.
Harada, Tsuneo: *See*—
Oyama, Kiyotaka; Irino, Shigeaki; Harada, Tsuneo; and Nakamura, Masao, 4,521,514, Cl. 435-70.000.
Haran, Dan: *See*—
Haran, Ilan; and Haran, Dan, 4,521,768, Cl. 340-566.000.
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Hardin, William R., to General Electric Company. Method and means for real time image zoom display in an ultrasonic scanning system. 4,520,671, Cl. 73-620.000.
Harding, Delbert. Base plate bolt hole marker. 4,520,571, Cl. 33-189.000.
Harigane, Kotaro; Tando, Shuichi; Takahashi, Kenichi; and Shudo, Hirokazu, to TDK Corporation. Apparatus for mounting chip type circuit elements on printed circuit boards. 4,520,557, Cl. 29-740.000.
Harrigan, Marvin, to Marvco Tool & Mfg. Inc. Adjustable telescopic support. 4,520,981, Cl. 248-413.000.
Harrington, Richard J.: *See*—
Thompson, David L.; Roline, Glenn M.; and Harrington, Richard J., 4,520,825, Cl. 128-422.000.
Harrington, William A., to Hughes Aircraft Company. Orientation detection system for thin-line towed sonar arrays. 4,521,875, Cl. 367-130.000.
Harris Corporation: *See*—
Hwan, Eugene J.; and Kajfez, Darko, 4,521,746, Cl. 331-96.000.
Harris, Martin, to Shell Oil Company. Pesticidal nitromethylene derivatives. 4,521,536, Cl. 514-226.000.
Harry, John E.: *See*—
Burnham, Robert F.; Gibbon, Alan; and Harry, John E., 4,521,890, Cl. 373-22.000.
Harry Wolf & Sons: *See*—
Valikov, Sioma, 4,520,537, Cl. 24-616.000.
Harsco Corporation: *See*—
Digh, Frank, 4,520,989, Cl. 249-13.000.
Walker, Eugene P., 4,520,988, Cl. 249-13.000.
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Gessel, James M.; Kunz, Gary L.; and Scheidenhelm, E. Louis, 4,520,620, Cl. 56-400.000.
Hart, Cecil C. Mattress carrier. 4,521,045, Cl. 294-149.000.
Harte, J. Richard. Computer assisted teaching machine that uses two sets of conductive strips. 4,521,199, Cl. 434-339.000.
Hartmann, Achim; and Thumm, Hans, to Kronos Titan - G.m.b.H. Process for the production of nearly aluminium chloride-free titanium tetrachloride from titaniferous raw materials containing aluminum compounds. 4,521,384, Cl. 423-72.000.
Hashimoto, Akira: *See*—
Ninomiya, Yoshinobu; Somezawa, Masashi; and Hashimoto, Akira, 4,521,486, Cl. 428-407.000.
Hashimoto, Yoshio: *See*—
Kimura, Kazuo; Taneda, Yukinori; Tsuyuki, Shinichi; Suzuki, Shun; Hashimoto, Yoshio; and Sakamoto, Shinichi, 4,520,965, Cl. 242-7.05B.
Hastings, Jerome K.; Bigelow, James H.; and Pearson, Robert L., to Eaton Corporation. High speed electromagnetic mechanical switch. 4,521,757, Cl. 335-79.000.
Hata, Hiroyuki. Clothing clasp. 4,520,536, Cl. 24-498.000.
Hata, Hitoshi: *See*—
Tsubouchi, Toshiyuki; and Hata, Hitoshi, 4,521,324, Cl. 252-73.000.
Hata, Kosei, to Seiken Kai Foundation Juridical Person. Bacterial strain for purifying hydrocarbons pollution and purification process. 4,521,515, Cl. 435-248.000.
Hatala, John, to Temco Home Health Care Products, Inc. Three point clamping means for a shower bench. 4,520,515, Cl. 4-579.000.
Hatamura, Yotaro. Load converter. 4,520,679, Cl. 73-862.040.
Hatch, Douglas J.: *See*—
Bingham, Joseph P.; and Hatch, Douglas J., 4,521,809, Cl. 358-120.000.
Hatori, Yukiyoshi; Yagi, Eiji; and Kobari, Yuji, to Nissan Motor Co., Ltd. System for stabilizing idling of vehicular engine. 4,520,777, Cl. 123-339.000.
Hattori, Yoshihiro; Watanabe, Takashi; and Maeda, Kunio, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyacetal resin composition excellent in heat stability and surface processability and process for surface treating same. 4,521,488, Cl. 428-409.000.
Hattori, Yoshinori: *See*—
Miura, Kazunori; Hattori, Yoshinori; and Matsuo, Yasushi, 4,521,358, Cl. 264-65.000.
Haug, Werner, to Frama AG. Setting mechanism for type wheels of a printing device. 4,520,725, Cl. 101-91.000.
Hauser, Anton: *See*—
Demus, Dietrich; Vorbrodt, Hans-Matthias; Hauser, Anton; Vogel, Jorg; and Zaschke, Horst, 4,521,327, Cl. 252-299.610.
Hausman, Mary L.; and Lenney, William E., to Air Products and Chemicals, Inc. Vinyl acetate/ethylene copolymer emulsions exhibiting both partially- and fully-hydrolyzed polyvinyl alcohol compatibility. 4,521,561, Cl. 524-459.000.
Haverstock, Wayne; Krywchuk, David; and Masak, Peter, to Universal Industries Ltd. Pump jack slant wells. 4,520,683, Cl. 74-41.000.
Hawes, Samuel R., Jr.: *See*—
Olson, Peter D.; and Hawes, Samuel R., Jr., 4,521,647, Cl. 179-84.0VF.
Hawkins, Lawrence A.: *See*—
Baker, Robert D.; Driggers, Gerald W.; Gray, Ronald W.; and Hawkins, Lawrence A., 4,521,229, Cl. 55-137.000.
Hax, Jorg: *See*—
Engelhardt, Friedrich; Schmitz, Hermann; Gulden, Walter; and Hax, Jorg, 4,521,579, Cl. 526-287.000.
Hay, James V.; and Sauers, Richard F., to Du Pont de Nemours, E. I., and Company. Herbicidal benzenesulfonamides. 4,521,241, Cl. 71-92.000.
Hayashi, Hideki; and Kikuchi, Kenichi, to Sumitomo Electric Industries, Ltd. Semiconductor device integrating a laser and a transistor. 4,521,888, Cl. 372-50.000.
Hayashi, Mitsuji; Endo, Hideo; Oishibashi, Hirotsugu; Aichi, Takeo; and Sasaki, Shigeru, to Japanese National Railways; and Kyushu Tetsudo Kiki Mfg., Co., Ltd. Build-up spraying apparatus. 4,520,756, Cl. 118-699.000.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Internal combustion engine. 4,520,771, Cl. 123-195.00H.
Hayashibara, George M.: *See*—
Tahim, Raghbir S.; Hayashibara, George M.; and Chang, Kai, 4,521,747, Cl. 331-107.0SL.
Hayes, Ellen J., administratrix: *See*—
Hayes, Lawrence P., deceased; Hayes, Ellen J., administratrix; Jain, Kantilal; and Kerth, Randall T., 4,521,087, Cl. 350-574.000.
Hayes, Lawrence P., deceased; by Hayes, Ellen J., administratrix; Jain, Kantilal; and Kerth, Randall T., to International Business Machines Corporation. Optical system with diffuser for transformation of a collimated beam into a self-luminous arc with required curvature and numerical aperture. 4,521,087, Cl. 350-574.000.
Hayes, Susan M. Drip-type coffee making apparatus. 4,520,716, Cl. 99-306.000.
Hayworth, Lawrence T., to Mars, Incorporated. Microencapsulation process. 4,521,352, Cl. 264-4.300.

Hazelwood, Louis S.: *See—*
Rehfuss, John W.; Hazelwood, Louis S.; Price, Martin B.; and Zilke, Robert W., Jr., 4,521,489, Cl. 428-412.000.

Hedegard, Peter L.: *See—*
Raymor, Willard E.; and Hedegard, Peter L., 4,521,255, Cl. 134-33.000.

Hedstrom, Norman A.: *See—*
Cournoyer, Bernard T.; and Hedstrom, Norman A., 4,520,976, Cl. 248-56.000.

Hegi, Paul, to Lupa Finances S.A. Automatic dialer for telephone numbers. 4,521,648, Cl. 179-90.00B.

Heida, Bernd: *See—*
Wickenhaeuser, Gerhard; Heida, Bernd; Graf, Fritz; and Hupfer, Leopold, 4,521,632, Cl. 568-492.000.

Heidelberger Druckmaschinen AG: *See—*
Darda, Walter, 4,521,007, Cl. 270-47.000.

Heijmen, Hendricus J.: *See—*
Wattimena, Freddy; and Heijmen, Hendricus J., 4,521,630, Cl. 568-435.000.

Heilen, Gerd: *See—*
Rebafka, Walter; Heilen, Gerd; Halbritter, Klaus; and Franzischka, Wolfgang, 4,521,602, Cl. 546-184.000.

Heilos, Johannes: *See—*
Arntz, Dietrich; Prescher, Gunter; Burkhardt, Werner; Heilos, Johannes; and Manner, Reinhard, 4,521,618, Cl. 562-535.000.

Heim, Lloyd S.: *See—*
Dix, Gary L.; Heim, Lloyd S.; Herald, Robert F.; and Quinlan, William P., 4,521,884, Cl. 371-15.000.

Heimer, Malcolm L., to Cordis Corporation. Switched capacitor amplifier. 4,521,743, Cl. 330-296.000.

Heinen, Frank B.: *See—*
St. Vincent, Valerie A.; Heinen, Frank B.; and Rinell, Steven J., 4,520,805, Cl. 128-80.00R.

Heithoff, Robert B., to PPG Industries, Inc. Method and apparatus for controlling wall layer thickness in a liquefaction process. 4,521,235, Cl. 65-29.000.

Heithoff, Robert B., to PPG Industries, Inc. Method and apparatus for controlling an ablation liquefaction process. 4,521,238, Cl. 65-135.000.

Heitz, Walter; and Risse, Wilhelm, to Bayer Aktiengesellschaft. Process for the production of bifunctional polyphenylene ethers. 4,521,584, Cl. 528-214.000.

Heller, Aaron J.: *See—*
Winkler, Dean M.; Curtis, Jeffrey B.; and Heller, Aaron J., 4,521,865, Cl. 364-608.000.

Helmbold, Walter. Energy storage apparatus. 4,520,862, Cl. 165-10.000.

Hemmerling, Horst: *See—*
Alig, Franz; Hemmerling, Horst; and Neulinger, Franz, 4,521,226, Cl. 55-21.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Schumann, Henning; Busch, Peter; Fischer, Detlef; and Thiele, Klaus, 4,520,831, Cl. 132-11.00R.

Hennrich, Norbert: *See—*
Lundstrom, Kurt I.; Arwin, Hans R.; Rieke, Erwin; Sielaff, Gunter; and Hennrich, Norbert, 4,521,522, Cl. 436-525.000.

Henrikson, Stig A. Apparatus for extracting at least the inherent kinetic energy from waves. 4,521,152, Cl. 415-2.00R.

Hensler, David L. Control wand for overhead personnel crane. 4,520,894, Cl. 182-2.000.

Herald, Robert F.: *See—*
Dix, Gary L.; Heim, Lloyd S.; Herald, Robert F.; and Quinlan, William P., 4,521,884, Cl. 371-15.000.

Herbert, Alan J., to Minnesota Mining and Manufacturing Company. Highly photosensitive aqueous solvent-developable printing assembly. 4,521,503, Cl. 430-49.000.

Hercules Incorporated: *See—*
Class, Jay B., 4,521,493, Cl. 428-498.000.

Hergeth, Hubert. Apparatus for making a web from fibers. 4,520,531, Cl. 19-105.000.

Hermann Hemscheidt Maschinenfabrik GmbH & Co.: *See—*
Hovorka, Reiner; and Riedhammer, Josef, 4,520,712, Cl. 91-505.000.

Herron, Charles R., to Baker International Corp. Short displacement double acting vehicle suspension system. 4,520,734, Cl. 105-157.00R.

Herron, Maynard M.: *See—*
Smith, David R.; and Herron, Maynard M., 4,520,878, Cl. 172-705.000.

Herschel Corporation: *See—*
Sorensen, Wayne E.; and Johnson, Larry E., 4,520,618, Cl. 56-310.000.

Herzog, Klaus; Szenger, Franz; and Gentner, Gabriele, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Tailstock for rotatably mounting a workpiece in precision machinery. 4,520,700, Cl. 82-31.000.

Hess, Lloyd D., Jr.: *See—*
Patterson, Dennis B.; Parker, Dane K.; and Hess, Lloyd D., Jr., 4,521,574, Cl. 526-204.000.

Hesston Corporation: *See—*
Smith, David R.; and Herron, Maynard M., 4,520,878, Cl. 172-705.000.

Heuber, Klaus; and Wiedmann, Siegfried K., to International Business Machines Corporation. Method of and circuit arrangement for reading an integrated semiconductor store with storage cells in MTL (I^2L) technology. 4,521,873, Cl. 365-190.000.

Hevezi, James M.: *See—*
Ong, Poen S.; Zermeno, Alfonso; Marsh, Lee M., Jr.; Hevezi, James M.; and Cowart, Ronald W., 4,521,808, Cl. 358-111.000.

Hicks, Alfonza; and Hankins, Jerry E., to Exxon Research & Engineering Co. Solids separation in a self-circulating magnetically stabilized fluidized bed. 4,521,303, Cl. 209-454.000.

Hicks, Irwin A.; and Albrecht, Charles W., to Singer Company, The. Adjustable tangent assembly for a diaphragm gas meter. 4,520,676, Cl. 73-281.000.

Hiestand, Karl, to SMW Schneider & Weisshaupt GmbH. Power operated chuck having centrifugal force compensation. 4,521,028, Cl. 279-1.00C.

Higginbotham, John W.; and Dowden, Dennis C., to McDonnell Douglas Corporation. Pulse coded optical attenuation meter. 4,521,115, Cl. 356-432.000.

Highsmith, Ronald E. Gel-forming compositions and the use thereof. 4,521,452, Cl. 427-136.000.

Hilker, G. Daniel; Lausen, Verne H.; Coon, Jessie H.; Bodette, James E.; Grimes, Jerry L.; Wright, Roger D.; Disque, Donny R.; and Bultemeier, Keith D., to Phelps Dodge Magnet Wire Co. Apparatus for manufacturing magnet wire. 4,521,173, Cl. 425-113.000.

Hill, Norman L.: *See—*
Maggio, Richard A.; Maggio, Leonard C.; and Hill, Norman L., 4,520,527, Cl. 15-235.800.

Hindermyer, Charles. Fishing lure. 4,520,588, Cl. 43-42.060.

Hiniker Company: *See—*
Peterson, Richard L.; Scheurer, Roger J.; and Steinberg, Richard W., 4,520,876, Cl. 172-427.000.

Hinkle, John F., Jr.: *See—*
Breuninger, Robert E., 4,520,753, Cl. 118-500.000.

Hinz, Lorne C.: *See—*
Dupuis, Claude R.; and Hinz, Lorne C., 4,521,643, Cl. 179-2.0DP.

Hirai, Masayoshi; Tanaka, Junzo; and Ueda, Katsuroh, to Matsushita Electric Industrial Co., Ltd. Cooking appliance. 4,521,183, Cl. 432-37.000.

Hiraki, Shunichi; Kinoshita, Hiroshi; Kumamaru, Kuniaki; Koguchi, Shigeo; and Yonezawa, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of making integrated devices having long and short minority carrier lifetimes. 4,521,256, Cl. 148-1.500.

Hirano, Hiroyuki: *See—*
Mori, Kyoichiro; and Hirano, Hiroyuki, 4,521,568, Cl. 525-309.000.

Hirano, Yoshinori: *See—*
Shimonosono, Hitoshi; Ogawa, Naoki; and Hirano, Yoshinori, 4,520,768, Cl. 123-41.440.

Hirose, Iwao: *See—*
Suzuki, Shigeyoshi; Yamada, Jun; Senga, Takao; Kuriu, Sadao; Yamasaki, Masahiro; Hirose, Iwao; and Maegawa, Tokubee, 4,521,101, Cl. 355-10.000.

Hirose, Takao: *See—*
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,521,294, Cl. 208-23.000.

Hirota, Ken; Fujimoto, Yoshiaki; Watanabe, Kouichi; and Sugimura, Minoru, to Matsushita Electric Industrial Co., Ltd. Polycrystalline ferrite and a magnetic head using the same. 4,521,323, Cl. 252-62.590.

Hirota, Toshio: *See—*
Ozawa, Masuo; and Hirota, Toshio, 4,520,764, Cl. 123-3.000.

Hisanaga, Akinori: *See—*
Iijima, Tokuzo; Yamamoto, Toshiharu; Kishimoto, Kazuo; Komabashiri, Takamichi; Kano, Toshiji; and Hisanaga, Akinori, 4,521,289, Cl. 204-253.000.

Hisatsune, Fumiyuki: *See—*
Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,521,653, Cl. 200-144.00C.

Hitachi Automotive Engineering Co., Ltd.: *See—*
Momono, Masakichi; Moriya, Hisanori; Souma, Masahiro; and Hamashima, Eiji, 4,520,962, Cl. 239-585.000.

Hitachi Construction Machinery Co., Ltd.: *See—*
Nakajima, Kichio; Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; and Honma, Kazuo, 4,520,626, Cl. 60-468.000.

Hitachi Denshi Kabushiki Kaisha: *See—*
Kougami, Akihiko; Mita, Seiichi; Kirino, Toru; and Nagahara, Shusaku, 4,521,816, Cl. 360-45.000.

Hitachi Koki Company, Limited: *See—*
Kimura, Kazuo; Taneda, Yukinori; Tsuyuki, Shinichi; Suzuki, Shun; Hashimoto, Yoshio; and Sakamoto, Shinichi, 4,520,965, Cl. 242-7.05B.

Hitachi, Ltd.: *See—*
Fukushima, Isao; Kuwahara, Kazuyoshi; Itoigawa, Keiichi; Kobori, Yasunori; and Nishijima, Hideo, 4,521,750, Cl. 333-28.00R.
Momono, Masakichi; Moriya, Hisanori; Souma, Masahiro; and Hamashima, Eiji, 4,520,962, Cl. 239-585.000.
Nakajima, Tadakatsu; Nakayama, Wataru; and Daikoku, Takahiro, 4,520,866, Cl. 165-115.000.
Oouchi, Tomihisa; Usui, Sampei; Fukuda, Tamio; and Nishiguchi, Akira, 4,520,634, Cl. 62-476.000.
Sawada, Hideo; and Yata, Kiyoshi, 4,521,872, Cl. 365-49.000.
Yoshida, Takashi; Fujie, Masakatsu; Matsuno, Junichi; and Ouchi, Hideyuki, 4,521,813, Cl. 358-296.000.

Hitachi Maxell Limited: *See—*
Watanabe, Osamu, 4,521,500, Cl. 429-174.000.

Hitachi Metals, Ltd.: *See—*
Samuels, Abe; Yamashita, Keitaro; and Sasaki, Yoshitaka, 4,521,184, Cl. 432-60.000.

Hitachi Microcomputer Engineering, Ltd.: *See—*
Fukushima, Isao; Kuwahara, Kazuyoshi; Itoigawa, Keiichi; Kobori, Yasunori; and Nishijima, Hideo, 4,521,750, Cl. 333-28.00R.

Hitchcock, Keith N., to Froude Consine Limited. Engine testing apparatus and methods. 4,520,660, Cl. 73-120.000.
Hoadley, Frederick L., to Borg-Warner Corporation. D-C Bus current monitoring system. 4,521,840, Cl. 363-35.000.
Hodge, Allan M. Solid waste receptacle security system. 4,520,945, Cl. 220-315.000.
Hodgson, Thomas D.; and Foot, William R., to United Kingdom Atomic Energy Authority. Agitator apparatus. 4,521,400, Cl. 423-658.500.
Hodogaya Chemical Co., Ltd.: *See*—
Okazaki, Hideo; Imagome, Hiroshi; Suzuka, Susumu; and Sakai, Kiyoshi, 4,521,605, Cl. 548-440.000.
Hoechst Aktiengesellschaft: *See*—
Finke, Manfred; and Mundnich, Rainer, 4,521,348, Cl. 260-940.000.
Kleiner, Hans-Jerg, 4,521,346, Cl. 260-543.00P.
Kleiner, Hans-Jerg, 4,521,347, Cl. 260-543.00P.
Papenfuhs, Theodor; and Volk, Heinrich, 4,521,617, Cl. 562-467.000.
Reichert, Gunter; Mainzer, Franz; Lehmann, Kurt; and Niermann, Hermann, 4,520,631, Cl. 62-188.000.
Stuhler, Herbert; and Krempl, Engelbert, 4,521,595, Cl. 536-127.000.
Hoechst-Roussel Pharmaceuticals Incorporated: *See*—
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,521,537, Cl. 514-302.000.
Hoffman, Kevin R.: *See*—
Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., 4,520,757, Cl. 118-723.000.
Hoffmann, Dietrich: *See*—
Eberhardt, Wolfgang; Hoffmann, Dietrich; Kriechbaum, Karl; and Rohde, Erwin, 4,521,654, Cl. 200-146.00R.
Hoffmann-La Roche Inc.: *See*—
Wick, Alexander E., 4,521,535, Cl. 514-222.000.
Hofmann, Peter, to Chemische Werke Huls AG. Methods for reprocessing cobalt catalysts used in hydrocarboxylation. 4,521,526, Cl. 502-24.000.
Holick, Michael F.; and Holick, Sally A., to General Hospital Corporation, The. Vitamin D glycosyl orthoesters. 4,521,410, Cl. 514-26.000.
Holick, Sally A.: *See*—
Holick, Michael F.; and Holick, Sally A., 4,521,410, Cl. 514-26.000.
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Russell, Philip P.; Niu, Tyan-Faung; and Holland, Frederic A., 4,521,457, Cl. 427-286.000.
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Fitton, Paul; and Holland, Peter J., 4,521,553, Cl. 523-333.000.
Hollis, Ralph L., Jr.: *See*—
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Holloway, Falis E. Automatic gate opener. 4,520,592, Cl. 49-358.000.
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Salomonsson, Goran; Borjesson, Per O.; Mandersson, Bengt; Holmer, Nils-Gunnar; and Lindstrom, Kjell, 4,520,670, Cl. 73-602.000.
Holmes, Donald P.; and McDonald, David I., to Cincinnati Milacron Inc. Impingement oven and method. 4,520,575, Cl. 34-23.000.
Holroyd, Ralph; and Spiller, Peter O., to Lucas Industries Limited. Fuel pumping apparatus. 4,520,782, Cl. 123-450.000.
Holt, John R., Jr., to General Electric Company. Noise blanking circuit and method. 4,521,917, Cl. 455-223.000.
Holt, William L.: *See*—
Carbeau, Richard W.; Martin, James F.; Lanier, John H.; and Holt, William L., 4,520,741, Cl. 110-344.000.
Holzhauser, Ronald C.; McGlen, James A.; and Lawniczak, Gary P., to Eastman Kodak Company. Apparatus for mounting a document feeder on a copier/duplicator. 4,520,977, Cl. 248-201.000.
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Kerimis, Dimitrios; Hombach, Rudolf; Muller, Peter; and Dollhausen, Manfred, 4,521,545, Cl. 521-107.000.
Homburg, Axel: *See*—
Diesinger, Walter; and Homburg, Axel, 4,520,972, Cl. 244-3.100.
Homola, Andrew M.: *See*—
Eldridge, Jerome M.; and Homola, Andrew M., 4,521,451, Cl. 427-130.000.
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Ban, Masaki, 4,520,688, Cl. 74-572.000.
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Satoh, Kazuo, 4,520,892, Cl. 180-219.000.
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Roberts, Thomas G.; and Honeycutt, Thomas L., 4,521,110, Cl. 356-350.000.
Honeywell Inc.: *See*—
Atherton, James H.; and Stanojevic, Silvo, 4,521,727, Cl. 323-294.000.
Bartels, James I., 4,521,705, Cl. 307-605.000.
Venkatasetty, Hanumanthiya V., 4,521,290, Cl. 204-412.000.
Honeywell Information Systems Inc.: *See*—
Bruce, Kenneth E.; Lombardo, Ralph M., Jr.; Tarbox, Bruce H.; and Conway, John W., 4,521,848, Cl. 364-200.000.
Genuit, Luther L.; and Nowell, John R., 4,521,692, Cl. 290-4.00A.
Trubisky, Leonard G.; and Shelly, William A., 4,521,851, Cl. 364-200.000.
Wilder, Richard P., Jr., 4,521,849, Cl. 364-200.000.
Wilhite, John E.; Shelly, William A.; and Ryan, Charles P., 4,521,850, Cl. 364-200.000.
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Liu, Yet-Zen; Hong, Chi-Shain; and Dapkus, P. Danial, 4,521,887, Cl. 372-45.000.
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Steinhauser, Thomas; and Buch, Thomas, 4,521,001, Cl. 266-208.000.
Hoogovens Groep B.V.: *See*—
Ouwerkerk, Johannes H. W.; Lucieer, Wouter B.; and Cramer, Rudolph E., 4,521,117, Cl. 366-165.000.
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Givens, Edwin N.; and Hoover, David S., 4,521,299, Cl. 208-254.00R.
Hori, Takahiro: *See*—
Obitsu, Masamichi; Hori, Takahiro; Koinuma, Toyoji; and Sakaguchi, Yuriko, 4,521,249, Cl. 106-12.000.
Horiba, Ltd.: *See*—
Hosokawa, Yoshinori, 4,521,905, Cl. 378-206.000.
Horikawa, Takeshi: *See*—
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Horikawa, Yoichi: *See*—
Morita, Toyoo; and Horikawa, Yoichi, 4,520,544, Cl. 29-408.000.
Horikawa, Yoshiaki, to Olympus Optical Co., Ltd. Focusing device for optical system. 4,521,108, Cl. 356-123.000.
Horimoto, Katsutoshi: *See*—
Ichimura, Mitsunori; Yamamoto, Ryoichi; and Horimoto, Katsutoshi, 4,521,378, Cl. 422-135.000.
Horwitz, Christopher M., to Unisearch Limited. Hollow cathode sputter etcher. 4,521,286, Cl. 204-192.00E.
Hosogai, Takeo: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Hosogai, Takeo; and Nishida, Takashi, 4,521,242, Cl. 71-94.000.
Hosokawa, Yoshinori, to Horiba, Ltd. Monitor of an X-ray radiation range. 4,521,905, Cl. 378-206.000.
Hosoya, Masahiro; and Ueno, Tsuyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Developing device. 4,521,098, Cl. 355-3.0DD.
Houlsby, Robert D., to CooperVision, Inc. Sterilizing treatment with hydrogen peroxide and neutralization of residual amounts thereof. 4,521,375, Cl. 422-29.000.
House Food Industrial Co., Ltd.: *See*—
Sugisawa, Ko; Matsumura, Yasushi; and Taga, Kazumitsu, 4,520,574, Cl. 34-5.000.
Hovorka, Reiner; and Riedhammer, Josef, to Hermann Hemscheidt Maschinenfabrik GmbH & Co. Axial piston machine having a sealed bearing box. 4,520,712, Cl. 91-505.000.
Howard, Robert, to Daventry Pty. Ltd. Display screens and the like. 4,520,584, Cl. 40-606.000.
Howe, Arthur T., to Standard Oil Company (Indiana). Multilayer photoelectrodes utilizing exotic materials. 4,521,800, Cl. 357-67.000.
Howe, Herbert E.: *See*—
Di Martini, Carl R.; Howe, Herbert E.; Scott, William L.; and Bulvanoski, Leo J., 4,521,247, Cl. 75-77.000.
Howell, Danny T.: *See*—
Howell, William T., Jr.; Howell, John T.; and Howell, Danny T., 4,521,036, Cl. 285-61.000.
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Howell, William T., Jr.; Howell, John T.; and Howell, Danny T., 4,521,036, Cl. 285-61.000.
Howell, Stephen L.: *See*—
Weil, Robert A., Jr.; and Howell, Stephen L., 4,520,707, Cl. 84-1.030.
Howell, William T., Jr.; Howell, John T.; and Howell, Danny T. Sprinkler head support. 4,521,036, Cl. 285-61.000.
Howeth, D. Franklin. Air filter unit with multiple filter chambers and particulate material collection hoppers. 4,521,232, Cl. 55-324.000.
Hoya Corporation: *See*—
Yamashita, Toshiharu, 4,521,524, Cl. 501-64.000.
Hoydic, Roberta L. Salad bowl. 4,520,633, Cl. 62-457.000.
HRI, Inc.: *See*—
Chervenak, Michael C.; Eccles, Richard M.; and Nongbri, Govanon, 4,521,295, Cl. 208-59.000.
Hsie, C. H., to Son Su-Kung. Catalyst for cracking kerosene. 4,521,529, Cl. 502-217.000.
Hsieh, Martin Y., to GTE Products Corporation. Silicon nitride bodies. 4,521,525, Cl. 501-98.000.
Huber, Franz R.; and Stark, Axel, to Rohde & Schwarz GmbH & Co., KG. Multifrequency antenna matching apparatus with antomatic tuning. 4,521,913, Cl. 455-121.000.
Hudgens, Stephen J.: *See*—
Ovshinsky, Stanford R.; Hudgens, Stephen J.; and Kastner, Marc A., 4,521,447, Cl. 427-45.100.
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Napolitano, Pellegrino E., 4,521,156, Cl. 415-11.000.
Hueber, Francois, to Fabrique de Produits Chimiques, d'Entretien et de Degraissage Ravicolor, S.A. Windshield washing spray with jet inclination variable as a function of the speed of the vehicle. 4,520,961, Cl. 239-284.00R.
Hughes Aircraft Company: *See*—
Harrington, William A., 4,521,875, Cl. 367-130.000.
Hughes Tool Company: *See*—
Vandevier, Joseph E., 4,521,708, Cl. 310-87.000.

Humber, Leslie G.: *See—*
Asselin, Andre A.; and Humber, Leslie G., 4,521,423, Cl. 514-290.000.
Asselin, Andre A.; Crosilla, Danilo A.; and Humber, Leslie G., 4,521,606, Cl. 548-503.000.
Hundt, Roger C.: *See—*
Jordan, William D.; Hundt, Roger C.; and Pritchett, James D., 4,521,827, Cl. 361-386.000.
Hunter, Arthur C.: *See—*
Caldwell, David; Ferrio, Linda J.; and Hunter, Arthur C., 4,521,868, Cl. 364-753.000.
Hunter, Patrick F.: *See—*
Redding, John R.; and Hunter, Patrick F., 4,521,149, Cl. 414-44.000.
Hupfer, Leopold: *See—*
Wickenhaeuser, Gerhard; Heida, Bernd; Graf, Fritz; and Hupfer, Leopold, 4,521,632, Cl. 568-492.000.
Huson, Gale W.: *See—*
Urban, Clement A.; and Huson, Gale W., 4,520,720, Cl. 100-26.000.
Husted, Raymond R.: *See—*
Ziehm, Richard T.; Wilczek, Stephen P.; Baker, George E.; Husted, Raymond R.; Dumas, Glen A.; Bunker, Keith G.; and Place, George H., Jr., 4,521,847, Cl. 364-184.000.
Husted, Royce H., to Husted, Royce H.; and Shiber, Samuel. Incrementally variable transmission. 4,521,207, Cl. 474-56.000.
Huth, Robert M. Two-wheeled vehicle kickstand support pad. 4,521,031, Cl. 280-293.000.
Hutter, Charles G., III, to Physical Systems, Inc. Freezeproof valve assembly. 4,520,836, Cl. 137-59.000.
Hwan, Eugene J.; and Kajfez, Darko, to Harris Corporation. Microwave oscillator with TM01δ dielectric resonator. 4,521,746, Cl. 331-96.000.
Hydril Company: *See—*
Blackburn, Jan W.; and Baron, Burl E., 4,521,042, Cl. 285-334.000.
Hydro-Quebec: *See—*
Simard, Julien, 4,521,822, Cl. 361-35.000.
Ichimura, Mitsunori; Yamamoto, Ryoichi; and Horimoto, Katsutoshi, to Mitsui Petrochemical Industries, Ltd. Fluid bed reactor system composed of cylindrical reaction vessel equipped with distribution plate and agitator. 4,521,378, Cl. 422-135.000.
Idemitsu Kosan Company Limited: *See—*
Kunihiro, Takatoshi; and Tsuchiya, Koji, 4,521,296, Cl. 208-87.000.
Tsubouchi, Toshiyuki; and Hata, Hitoshi, 4,521,324, Cl. 252-73.000.
Ihara, Kiyohiko: *See—*
Nakagawa, Shinichi; and Ihara, Kiyohiko, 4,521,575, Cl. 526-206.000.
Iida, Akio: *See—*
Katagiri, Nobuhiko; Matsubara, Hidenobu; and Iida, Akio, 4,520,864, Cl. 165-60.000.
Iida, Noriyoshi: *See—*
Katayama, Hajime; Nitanda, Hiroshi; Nagaoka, Tateki; Kishi, Hirotoshi; Takada, Yusaku; Iida, Noriyoshi; Inuzuka, Tsuneki; and Komiya, Yutaka, 4,521,099, Cl. 355-8.000.
Iijima, Tokuzo; Yamamoto, Toshiharu; Kishimoto, Kazuo; Komabashiri, Takamichi; Kano, Toshiji; and Hisanaga, Akinori, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method and apparatus for installation of a membrane to an electrolytic cell. 4,521,289, Cl. 204-253.000.
Iijima, Toshifumi; and Yamashita, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Multi-layer light-sensitive silver halide color photographic material. 4,521,507, Cl. 430-503.000.
Iizuka, Hajime: *See—*
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Ikeda, Hideo: *See—*
Sugimoto, Tadao; Ikeda, Hideo; Mifune, Hiroyuki; and Nakamura, Koki, 4,521,508, Cl. 430-567.000.
Ikeda, Masahiro, to Nippon Telegraph & Telephone Public Corporation. Optical switch. 4,521,069, Cl. 350-96.130.
Ikeda, Yasunari, to Sony Corporation. Double-scanning non-interlace color television receiver. 4,521,802, Cl. 358-11.000.
Illinois Tool Works Inc.: *See—*
Edwards, Bryant; Klygis, M. Julius; and Olsen, Robert C., 4,520,924, Cl. 206-150.000.
Frano, Francis G.; and Ruehl, William E., 4,520,748, Cl. 116-70.000.
Imagome, Hiroshi: *See—*
Okazaki, Hideo; Imagome, Hiroshi; Suzuka, Susumu; and Sakai, Kiyoshi, 4,521,605, Cl. 548-440.000.
Imatron Associates: *See—*
Rand, Roy E., 4,521,900, Cl. 378-137.000.
Rand, Roy E., 4,521,901, Cl. 378-138.000.
Imhof, Werner, to Posalux S.A. Machine tool. 4,520,551, Cl. 29-568.000.
Imoto, Tadashi: *See—*
Norota, Susumi; Kiriyama, Tsutomu; Imoto, Tadashi; and Azumi, Toshinori, 4,521,364, Cl. 264-176.00F.
Inaba, Humio; Ito, Hiromasa; and Ogawa, Yoh, to Tohoku University. Optical function semiconductor device. 4,521,681, Cl. 250-205.000.
Inaba, Nobuaki: *See—*
Sato, Hideyori; Inaba, Nobuaki; Arai, Mitsuru; and Onzou, Michio, 4,520,625, Cl. 60-464.000.
Inamori, Mikio: *See—*
Eguchi, Yasukata; Hanyu, Susumu; Takenoya, Hideaki; and Inamori, Mikio, 4,520,987, Cl. 248-635.000.
Inamoto, Tadayoshi: *See—*
Yokota, Masami; Sugitani, Hiroshi; and Inamoto, Tadayoshi, 4,521,787, Cl. 346-140.00R.
Inamura, Takahiro: *See—*
Murakami, Toshiaki; Enomoto, Yoichi; and Inamura, Takahiro, 4,521,682, Cl. 250-211.00J.
Info-Chem Inc.: *See—*
Witonsky, Robert J.; and Larsson, Raymond P., 4,521,376, Cl. 422-56.000.
Ingre, Lars: *See—*
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Inject Star Pokelmaschinen Gessellschaft m.b.H.: *See—*
Prosenbauer, Otto, 4,520,718, Cl. 99-535.000.
Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,521,328, Cl. 252-502.000.
Inoue, Kiyoshi, 4,521,660, Cl. 219-69.00W.
Inoue, Kiyoshi, 4,521,661, Cl. 219-69.00W.
Inoue, Kimio: *See—*
Watanabe, Shoji; Inoue, Kimio; and Okitsu, Kiyoshi, 4,521,570, Cl. 525-415.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of making carbon material. 4,521,328, Cl. 252-502.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. EDM Feed motor control method and system. 4,521,660, Cl. 219-69.00W.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for holding against mispositioning a thermally deflectable member in an operating machine tool. 4,521,661, Cl. 219-69.00W.
Inoue, Tokuta: *See—*
Matsushita, Souichi; Nakanishi, Kiyoshi; and Inoue, Tokuta, 4,520,783, Cl. 123-492.000.
Institut Francais du Petrole: *See—*
Candau, Francoise; Leong, Yee-Sing; Kohler, Norbert; and Dawans, Francois, 4,521,317, Cl. 252-8.55D.
Institut National de la Recherche Agronomique: *See—*
Bonnot, Guy; Laviolette, Pierre; Potiron, Andre; and Deysson, Jean-Yves, 4,521,353, Cl. 264-8.000.
Intermatic Incorporated: *See—*
Pezzolo, Donald E.; Pfeiffer, James W.; and Corder, Thomas E., 4,521,843, Cl. 364-145.000.
International Business Machines Corporation: *See—*
Arnold, Anthony F.; and Schmeckenbecher, Arnold F., 4,521,449, Cl. 427-96.000.
Bahrle, Dieter K.; and Schwerdt, Friedrich W., 4,521,280, Cl. 204-15.000.
Bednorz, Johannes G.; Hollis, Ralph L., Jr.; Lanz, Martin; Pohl, Wolfgang D.; and Yeack-Scranton, Celia E., 4,520,570, Cl. 33-180.00R.
Blumberg, Richard J.; Brenner, Stewart; and Robortaccio, Rocco J., 4,521,700, Cl. 307-456.000.
Dix, Gary L.; Heim, Lloyd S.; Herald, Robert F.; and Quinlan, William P., 4,521,884, Cl. 371-15.000.
Economy, James; and Zachariades, Anagnostis E., 4,520,647, Cl. 72-365.000.
Eldridge, Jerome M.; and Homola, Andrew M., 4,521,451, Cl. 427-130.000.
Guarnieri, C. Richard, 4,521,442, Cl. 427-38.000.
Hayes, Lawrence P., deceased; Hayes, Ellen J., administratrix; Jain, Kantilal; and Kerth, Randall T., 4,521,087, Cl. 350-574.000.
Heuber, Klaus; and Wiedmann, Siegfried K., 4,521,873, Cl. 365-190.000.
Murphy, Alan S., 4,521,774, Cl. 340-745.000.
Rhyne, James R., 4,521,770, Cl. 340-703.000.
Scalzi, Casper A.; and Schmalz, Richard J., 4,521,846, Cl. 364-200.000.
International Coal Refining Company: *See—*
Givens, Edwin N.; and Hoover, David S., 4,521,299, Cl. 208-254.00R.
International Flavors & Fragrances Inc.: *See—*
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,521,634, Cl. 568-665.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,521,613, Cl. 560-152.000.
Rutherford, Howard J.; and Withycombe, Donald A., 4,521,541, Cl. 521-79.000.
International Honeycomb Corporation: *See—*
Rothenberg, Lee M., Jr., 4,521,203, Cl. 446-106.000.
International Standard Electric Corporation: *See—*
Vance, Ian A. W.; and Goatcher, John K., 4,521,892, Cl. 375-88.000.
International Telephone and Telegraph Corporation: *See—*
Kurbikoff, Peter A.; and Bethurum, Gary C., 4,521,062, Cl. 339-14.00R.
Ranghelli, Joseph C.; and La Bella, Joseph A., 4,521,754, Cl. 333-224.000.
Intevep, S.A.: *See—*
Calderon, Jose L.; and Layrisse, Ignacio, 4,521,277, Cl. 196-46.000.
Inukai, Yuzo; and Shichijo, Yoshiaki, to Fuji Photo Film Co., Ltd. Spray type coating apparatus. 4,520,755, Cl. 118-629.000.
Inuzuka, Tsuneki: *See—*
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Ippisch, Ernest: *See—*
King, Harold B.; Masaitis, William; Ippisch, Ernest; and Chinn, Albert E., 4,521,862, Cl. 364-552.000.

Ireland, Eric, to Sigma Ltd. Component measuring instrument. 4,520,569, Cl. 33-148.00E.

Irino, Shigeaki: *See—*
Oyama, Kiyotaka; Irino, Shigeaki; Harada, Tsuneo; and Nakamura, Masao, 4,521,514, Cl. 435-70.000.

Irwin, J. Michael; and White, Jay P., to Irwin, J. Michael. Custom footbed support and method and apparatus for manufacturing same. 4,520,581, Cl. 36-88.000.

Isaac, Olivier; and Pignolet, Louis, to Rexroth-Sigma. Hydraulic distributors. 4,520,845, Cl. 137-624.270.

Isakson, John E.; and Nutting, H. Eugene, to Western Gear Machinery Co. Apparatus and method for simultaneously tensioning pipes. 4,521,132, Cl. 405-166.000.

Ishida, Tokuzi; and Aono, Kiyotaka, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Intake port structure for internal combustion engines. 4,520,776, Cl. 123-308.000.

Ishido, Takatsugu; and Horikawa, Takeshi, to Daicel Chemical Industries, Ltd. Process for preparing polyester elastomers. 4,521,571, Cl. 525-437.000.

Ishikawa, Takashi: *See—*
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Ishimura, Koichi: *See—*
Niino, Shuheu; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, 4,520,642, Cl. 72-8.000.

Isobe, Toshiaki; and Fukuda, Teruo, to Toyota Jidosha Kabushiki Kaisha. Method of and apparatus for controlling fuel injection. 4,520,784, Cl. 123-492.000.

Ito, Hiromasa: *See—*
Inaba, Humio; Ito, Hiromasa; and Ogawa, Yoh, 4,521,681, Cl. 250-205.000.

Ito, Yoshiyasu; Kobayashi, Fumiaki; and Miyagi, Hideo, to Toyota Jidosha Kabushiki Kaisha. Diesel fuel injection pump with fuel injection cutoff upon detection of excessive actual fuel combustion time. 4,520,780, Cl. 123-359.000.

Ito, Yuji, to Toyota Jidosha Kabushiki Kaisha. Coil spring compressor, with vertically adjustable clamp carriage. 4,520,543, Cl. 29-227.000.

Itoh, Katsuhisa: *See—*
Tanabe, Zenichi; Itoh, Katsuhisa; and Watanabe, Yoshiaki, 4,521,284, Cl. 204-71.000.

Itoh, Tomiyoshi: *See—*
Kawamura, Yasuo; Nishiyama, Tadashi; Itoh, Tomiyoshi; and Sakai, Takuo, 4,521,406, Cl. 424-94.000.

Itoigawa, Keiichi: *See—*
Fukushima, Isao; Kuwahara, Kazuyoshi; Itoigawa, Keiichi; Kobori, Yasunori; and Nishijima, Hideo, 4,521,750, Cl. 333-28.00R.

Itsubo, Junichi; Yazaki, Takashi; and Mori, Fumio, to Japan Crown Cork Co., Ltd. Pilfer-proof plastic closure for containers. 4,520,939, Cl. 215-252.000.

ITT Industries, Inc.: *See—*
Belart, Juan; Burgdorf, Jochen; Weise, Lutz; Kircher, Dieter; and Goossens, Andre F. L., 4,521,061, Cl. 303-114.000.
Kraft, Wolfgang, 4,520,553, Cl. 29-571.000.
Leonardsson, Per-Erik, 4,521,025, Cl. 277-89.000.

Iwahara, Makoto: *See—*
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Iwano, Yoshimi: *See—*
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Izumi, Eiki: *See—*
Nakajima, Kichio; Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; and Honma, Kazuo, 4,520,626, Cl. 60-468.000.

Izumi, Kazuo: *See—*
Ogawa, Hiroyasu; Izumi, Kazuo; and Shimazaki, Kenji, 4,520,623, Cl. 57-236.000.

Izushi, Takehiro: *See—*
Uemura, Masayuki; Murauchi, Akitsugu; and Izushi, Takehiro, 4,521,020, Cl. 273-85.00G.

J. I. Case Company: *See—*
Fachini, Robert M.; Barrett, Monroe C.; and McClure, Maxwell D., III, 4,520,617, Cl. 56-16.600.

J.M. Voith GmbH: *See—*
Schiel, Christian; Zurn, Georg; and Schmid, Karl, 4,520,578, Cl. 34-110.000.

Jacke, Stanley E., to SmithKline Diagnostics, Inc. Method for in house occult blood testing. 4,521,520, Cl. 436-66.000.

Jackisch, Philip F., to Ethyl Corporation. Process for making cyclic amines. 4,521,624, Cl. 564-446.000.

Jacobs Beverage Systems AG: *See—*
Hampel, Hans-Joachim; Scondo, Ludwig; Stahl, Jurgen; Wegner, Wilhelm; and Bonne, Harry, 4,520,948, Cl. 222-103.000.

Jacobs, Cornelis A. J.; Schellen, Johannes A. T.; and Van Der Vleuten, Anthonius P., to U.S. Philips Corporation. High-pressure metal vapor discharge lamp. 4,521,716, Cl. 313-594.000.

Jacobson, David N., to Monarch Marking Systems, Inc. Composite label web and method of labeling. 4,521,267, Cl. 156-249.000.

Jain, Kantilal: *See—*
Hayes, Lawrence P., deceased; Hayes, Ellen J., administratrix; Jain, Kantilal; and Kerth, Randall T., 4,521,087, Cl. 350-574.000.

James Dole Corporation: *See—*
Grof, Geza J., 4,520,528, Cl. 15-304.000.

James River-Norwalk, Inc.: *See—*
Gould, Jerome; and Kellogg, Thomas W., 4,520,946, Cl. 221-63.000.

James, Thomas A.: *See—*
Crosby, Gaius P.; and James, Thomas A., 4,520,736, Cl. 109-60.000.

Jan, Gerald; and Lenoir, John, to Ciba-Geigy AG. Oil-soluble disazo dyes and their use in color-photographic recording materials for the silver dye bleach process. 4,521,591, Cl. 534-821.000.

Jandy Industries: *See—*
Johnson, Bruce R., 4,520,514, Cl. 4-490.000.

Janome Sewing Machine Co. Ltd.: *See—*
Eguchi, Yasukata; Hanyu, Susumu; Takenoya, Hideaki; and Inamori, Mikio, 4,520,987, Cl. 248-635.000.

Janutka, William J.: *See—*
Ryczek, Lawrence J.; and Janutka, William J., 4,521,694, Cl. 307-266.000.
Ryczek, Lawrence J.; and Janutka, William J., 4,521,748, Cl. 331-108.00D.

Japan Crown Cork Co., Ltd.: *See—*
Itsubo, Junichi; Yazaki, Takashi; and Mori, Fumio, 4,520,939, Cl. 215-252.000.

Japan Synthetic Rubber Co., Ltd.: *See—*
Andoh, Naoki; and Fujiwara, Shuetsu, 4,521,622, Cl. 564-406.000.

Japanese National Railways: *See—*
Hayashi, Mitsuji; Endo, Hideo; Oishibashi, Hirotsugu; Aichi, Takeo; and Sasaki, Shigeru, 4,520,756, Cl. 118-699.000.

Jeans, Edward L., to Cadbury Schweppes Public Limited Company. In-home drink dispenser. 4,520,950, Cl. 222-129.100.

Jefferson, David A. Checklist device. 4,520,749, Cl. 116-325.000.

Jeffrey, Peter, to Yoshida Kogyo K.K. Load sensing apparatus with capacitive and inductive sensors. 4,520,885, Cl. 177-210.00C.

Jenck, Jean, to Rhone-Poulenc Chimie De Base. Carbonylation of monoolefins. 4,521,614, Cl. 560-193.000.

Jenkins, Richard L.; Pettus, John A.; and Abner, David K., to Getty Synthetic Fuels, Inc. Instrument and process for testing landfill gas for chlorinated hydrocarbons. 4,521,225, Cl. 55-18.000.

Jeol Ltd.: *See—*
Naito, Motohiro, 4,521,687, Cl. 250-296.000.

Jepmar: *See—*
Rampe, John F., 4,520,598, Cl. 51-163.200.

Jeremic, Miodrag. Adjustable wrench. 4,520,699, Cl. 81-166.000.

Jinnai, Koichiro, to Ricoh Company, Ltd. Ink viscosity regulation for ink jet printer. 4,521,789, Cl. 346-140.00R.

John, Heinz, deceased; and John nee Rueffler, Friedlinde, heiress, to Lindauer Dornier Gesellschaft mbH. Device for separating and delivering individual heddles to a draw-in position. 4,520,539, Cl. 28-206.000.

John nee Rueffler, Friedlinde, heiress: *See—*
John, Heinz, deceased; and John nee Rueffler, Friedlinde, heiress, 4,520,539, Cl. 28-206.000.

John Thurley Limited: *See—*
Arnold, Gerald D., 4,520,761, Cl. 122-31.00R.

Johnson, Alan L. Electro-optical solid-state SPDT relay switch. 4,521,693, Cl. 307-252.00T.

Johnson, Bruce R., to Jandy Industries. Fitting for a swimming pool return line. 4,520,514, Cl. 4-490.000.

Johnson, Douglas M., to Empak Inc. Package. 4,520,925, Cl. 206-334.000.

Johnson, Herbert H.: *See—*
Olsen, Ole B.; Bilik, Charles W.; Johnson, Herbert H.; and Jozepaitis, Charles M., 4,521,161, Cl. 417-68.000.

Johnson, Larry E.: *See—*
Sorensen, Wayne E.; and Johnson, Larry E., 4,520,618, Cl. 56-310.000.

Johnson Matthey Public Limited Company: *See—*
Burnham, Robert F.; Gibbon, Alan; and Harry, John E., 4,521,890, Cl. 373-22.000.

Johnson, Nancy C.; and Gotzmer, Carl, Jr., to United States of America, Navy. Detonation-transfer energetic composition. 4,521,260, Cl. 149-19.910.

Johnston, David F.: *See—*
Buckley, John D.; Swaim, Robert J.; Fox, Robert L.; and Johnston, David F., 4,521,659, Cl. 219-10.770.

Johnston, Lawton L.; and Brandon, Craig A. Mercerization process and apparatus. 4,520,520, Cl. 8-151.000.

Jones, John H.; and Schoenleber, Donald W., to Beatrice Foods Co. Multi-compartment envelope for coupon nesting. 4,520,958, Cl. 229-72.000.

Jones, Robert J.; and Chang, Glenn E. C., to TRW Inc. 2,2-Bis[(2-halo-4-aminophenoxy)phenyl]-hexafluoropropane. 4,521,623, Cl. 564-430.000.

Jordan, William D.; Hundt, Roger C.; and Pritchett, James D., to Thermalloy, Inc. Heat sink mounting. 4,521,827, Cl. 361-386.000.

Joseph, Eric D., to Motorola, Inc. PNP comparator circuit having beta current error cancellation. 4,521,697, Cl. 307-355.000.

Joy Manufacturing Holdings Limited: *See—*
Frater, John S.; and Pope, David W., 4,521,151, Cl. 415-131.000.

Jozepaitis, Charles M.: *See—*
Olsen, Ole B.; Bilik, Charles W.; Johnson, Herbert H.; and Jozepaitis, Charles M., 4,521,161, Cl. 417-68.000.

Juergens, Tristan D., to Gates Energy Products, Inc. Through-the-partition intercell connection and method. 4,521,498, Cl. 429-59.000.

Juskevic, John, to Essential Automotive Products, Inc. Key cutting machine. 4,521,142, Cl. 409-82.000.

Kabashima, Kazuo; and Tanaka, Kyugo, to Asahi Kasei Kogyo Kabushiki Kaisha. Coloring method and color-forming material. 4,521,793, Cl. 346-201.000.

Kabelmetal Electro GmbH: *See—*
Ziemek, Gerhard; Schatz, Friedrich; and Meyer, Hermann, 4,520,622, Cl. 57-59.000.

Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Miyake, Toshio; Sakai, Shuzo; and Shibuya, Takashi, 4,521,252, Cl. 127-46.300.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Fukuda, Masao, 4,520,883, Cl. 177-1.000.
Mikami, Yoshiharu, 4,520,884, Cl. 177-58.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Sato, Hideyori; Inaba, Nobuaki; Arai, Mitsuru; and Onzou, Michio, 4,520,625, Cl. 60-464.000.

Kabushiki Kaisha Morita Seisakusho: *See*—
Nakayama, Shozo; and Ogino, Sekiya, 4,521,190, Cl. 433-132.000.

Kabushiki Kaisha Takuma: *See*—
Takehara, Nobuo, 4,520,738, Cl. 110-171.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Yamamoto, Minoru; Sakata, Jiro; and Doi, Haruo, 4,521,236, Cl. 65-31.000.

Kachur, Nicholas W.: *See*—
Tomburo, Anthony F.; and Kachur, Nicholas W., 4,521,127, Cl. 401-68.000.

Kaczinski, Friedrich: *See*—
Blum, Rainer; Seitz, Max; and Kaczinski, Friedrich, 4,521,555, Cl. 524-63.000.

Kadija, Igor V., to Olin Corporation. Process and apparatus for continuously producing multivalent metals. 4,521,281, Cl. 204-25.000.

Kado, Yoshikazu: *See*—
Matsuda, Yoshihiro; Kimishima, Hiroshi; and Kado, Yoshikazu, 4,520,932, Cl. 209-545.000.

Kaempfer, Knut: *See*—
Broecker, Franz J.; Gettert, Hans; and Kaempfer, Knut, 4,521,387, Cl. 423-210.000.

Kageyama, Yoshikazu; Nagasaki, Sakon; and Mino, Mineo, to Matsushita Electric Industrial Co., Ltd. Battery voltage level detecting apparatus. 4,521,735, Cl. 324-433.000.

Kagiyama, Tsutomu; and Takaishi, Tatsuyuki, to Ohi Seisakusho Co., Ltd. Centrifugal clutch with radially movable magnetic member. 4,520,914, Cl. 192-71.000.

Kahle Engineering Co.: *See*—
Logothetis, Emanuel N., 4,521,237, Cl. 65-42.000.

Kahn, Leonard R. Speaker systems for producing balanced stereo images at multiple locations. 4,521,906, Cl. 381-24.000.

Kaiser, William J., to Ford Motor Company. Circuits for obtaining a voltage reading from a sensing element. 4,520,653, Cl. 73-23.000.

Kajfez, Darko: *See*—
Hwan, Eugene J.; and Kajfez, Darko, 4,521,746, Cl. 331-96.000.

Kalaugher, Patrick G., to University of Exeter. Binocular presentation of visual information. 4,521,074, Cl. 350-145.000.

Kaleda, William W.: *See*—
Zeller, Bary L.; Kaleda, William W.; and Saleeb, Fouad Z., 4,521,438, Cl. 426-271.000.

Kamiguchi, Taiji: *See*—
Nishimura, Yasuyuki; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Kuwahara, Takanori; and Tanimoto, Hirotoshi, 4,521,631, Cl. 568-478.000.

Kamiller, Neil A., to Reliance Electric Company. Peak charging circuit providing for improved loop gain and common mode noise rejection. 4,521,841, Cl. 363-45.000.

Kamiya, Joji: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,521,415, Cl. 514-252.000.

Kammiller, Neil A., to Reliance Electric Company. Circuit for controlling the volt-ampere characteristic of a load sharing power supply at no load and for inserting a preload. 4,521,842, Cl. 363-71.000.

Kanamaru, Tsuneo; Shinagawa, Susumu; and Asai, Mitsuko, to Takeda Chemical Industries, Ltd. Physiologically active substance FA-5859, its derivative, their production and use. 4,521,432, Cl. 514-556.000.

Kanazawa, Junpei: *See*—
Abe, Eiji; and Kanazawa, Junpei, 4,520,889, Cl. 180-168.000.

Kandachi, Takayoshi; Okino, Seiki; Yanai, Toshiharu; and Tanaka, Katsuto, to Central Glass Company, Limited. Method of producing heat-reflecting glass plate by coating with titanium oxide film. 4,521,454, Cl. 427-168.000.

Kane, James A.: *See*—
Kraemer, Alan D.; and Kane, James A., 4,521,858, Cl. 364-200.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Iijima, Tokuzo; Yamamoto, Toshiharu; Kishimoto, Kazuo; Komabashiri, Takamichi; Kano, Toshiji; and Hisanaga, Akinori, 4,521,289, Cl. 204-253.000.
Oizumi, Masayuki; Abe, Masaharu; and Fushiki, Yasuo, 4,521,491, Cl. 428-458.000.

Kaneko, Hiroko: *See*—
Miyake, Kiyoshi; and Kaneko, Hiroko, 4,521,081, Cl. 350-357.000.

Kanematsu, Hiroyuki; Nagae, Akimitsu; Mizoguchi, Kiyohisa; and Ohashi, Hajime, to Yamazaki Machinery Works, Ltd. Methods of entering machining information and display therefor in a numerically controlled machine tool. 4,521,860, Cl. 364-474.000.

Kanematu, Tetuo, to Daicel Chemical Industries, Ltd. Process for producing sodium carboxymethylcellulose. 4,521,594, Cl. 536-98.000.

Kanematu, Tetuo: *See*—
Otake, Etsuo; Kimura, Mamoru; Yokota, Hiromu; and Kanematu, Tetuo, 4,521,251, Cl. 106-183.000.

Kano, Toshiji: *See*—
Iijima, Tokuzo; Yamamoto, Toshiharu; Kishimoto, Kazuo; Komabashiri, Takamichi; Kano, Toshiji; and Hisanaga, Akinori, 4,521,289, Cl. 204-253.000.

Kaplan, Jean-Pierre, to Synthelabo. Therapeutically useful sulphur-containing benzylidene derivatives. 4,521,619, Cl. 514-315.000.

Kapral, Christopher W., to GTE Automatic Electric Laboratories, Incorporated. Integratable D/A converter. 4,521,762, Cl. 340-347.0DA.

Karasawa, Shuichi: *See*—
Sakuma, Seiitj; and Karasawa, Shuichi, 4,521,504, Cl. 430-57.000.

Karl Mengele & Sohne: *See*—
Reiff, Harro, 4,520,933, Cl. 209-606.000.

Karol, Thomas J., to Texaco Inc. Lubricant compositions containing both hydrocarbyl substituted mono and bissuccinimide having polyamine chain linked hydroxacyl radicals, and neopentyl derivative. 4,521,318, Cl. 252-46.700.

Kasai, Kazumi, to Nippon Notion Kogyo Co., Ltd. Strap guide for strap adjustment assembly. 4,520,533, Cl. 24-198.000.

Kasai, Kazumi, to Yoshida Kogyo K. K. Slide fastener having discrete coupling elements. 4,520,535, Cl. 24-410.000.

Kastner, Marc A.: *See*—
Ovshinsky, Stanford R.; Hudgens, Stephen J.; and Kastner, Marc A., 4,521,447, Cl. 427-45.100.

Kasuga, Masao, to Victor Company of Japan, Limited. IIR digital filter having low coefficient sensitivity. 4,521,867, Cl. 364-724.000.

Katagiri, Nobuhiko; Matsubara, Hidenobu; and Iida, Akio, to Toshiba Electric Appliances Co., Ltd. Year-round air conditioner with evaporator band and special heater placement. 4,520,864, Cl. 165-60.000.

Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, to Mitsui Toatsu Kagaku Kabushiki Kaisha. 6-(Substituted phenyl)-4,5-dihydro-3(2H)-pyridazinone compounds. 4,521,415, Cl. 514-252.000.

Katakura, Masayuki: *See*—
Akagiri, Kenzo; and Katakura, Masayuki, 4,521,738, Cl. 330-134.000.

Kataoka, Hironori: *See*—
Fujita, Takeshi;; Mori, Shigeo; Kataoka, Hironori; and Taniuchi, Akira, 4,521,586, Cl. 528-297.000.

Kataoka, Hiroyuki: *See*—
Suganuma, Saburo; and Kataoka, Hiroyuki, 4,521,096, Cl. 355-3.00R.

Katayama, Hajime; Nitanda, Hiroshi; Nagaoka, Tateki; Kishi, Hirotoshi; Takada, Yusaku; Iida, Noriyoshi; Inuzuka, Tsuneki; and Komiya, Yutaka, to Canon Kabushiki Kaisha. Copying apparatus. 4,521,099, Cl. 355-8.000.

Kathmann, Peter B., to RMC Rotary Motor Company AG. Sealing means for a rotary piston engine. 4,521,168, Cl. 418-137.000.

Kato, Osamu: *See*—
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,521,294, Cl. 208-23.000.

Kato, Taketoshi; and Onoe, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device with composite lead wire. 4,521,801, Cl. 357-71.000.

Katoh, Kazuo: *See*—
Asai, Shinichiro; Katoh, Kazuo; and Nakano, Tatsuo, 4,521,476, Cl. 428-209.000.

Katz, Hart V.: *See*—
Wodlinger, Harold; and Katz, Hart V., 4,521,186, Cl. 433-71.000.

Kauffman, William J.; and Martin, Pamela H., to Armstrong World Industries, Inc. Polyvinyl chloride resin particles dyed with cationic dyestuffs and process of preparation. 4,521,215, Cl. 8-508.000.

Kawabata, Takashi; and Yamada, Masanori, to Canon Kabushiki Kaisha. Automatic focusing device used in combination with auxiliary light source. 4,521,093, Cl. 354-403.000.

Kawaguchi, Yoshio: *See*—
Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, 4,521,665, Cl. 219-117.100.

Kawai, Toshiyuki: *See*—
Miki, Isao; and Kawai, Toshiyuki, 4,520,541, Cl. 29-156.8CF.

Kawamura, Yasuo; Nishiyama, Tadashi; Itoh, Tomiyoshi; and Sakai, Takuo, to Chisso Corporation. Antitumor agent. 4,521,406, Cl. 424-94.000.

Kayser-Roth Hosiery, Inc.: *See*—
Shields, Harper; and Lineberry, Roger D., 4,520,635, Cl. 66-185.000.

Kazuma, Koji: *See*—
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; Koumura, Noboru; and Kazuma, Koji, 4,521,805, Cl. 358-75.000.

Keesling, Evan L.: *See*—
Stewart, E. Allen; and Keesling, Evan L., 4,520,616, Cl. 56-9.000.

Keitaro, Yonezawa, to Aioi Seiki Kabushiki Kaisha. Work-clamp pallet for machine tool. 4,520,919, Cl. 198-648.000.

Keller, Hartmut; Krauth, Axel; and Kriener, Roswitha, to Rosenthal Aktiengesellschaft. Decorative flatware handles and process for their preparation. 4,521,356, Cl. 264-60.000.

Kelley, Arnold E.; Block, Michael J.; and Skripek, Milan R., to Union Oil Company of California. Method for producing needle coke. 4,521,278, Cl. 201-17.000.

Kellogg, Thomas W.: *See*—
Gould, Jerome; and Kellogg, Thomas W., 4,520,946, Cl. 221-63.000.

Kempe, Hans I., to Deutsch Company, Electronic Components Division, The. Electrical connector with non-precockable coupling ring. 4,521,066, Cl. 339-89.00M.

Kendall Company, The: *See*—
Steigerwald, Carl J., 4,521,213, Cl. 604-323.000.

Kennedy Company: *See*—
Rasmussen, Donald O.; Chow, William C.; and Davio, Franklin J., 4,520,970, Cl. 242-195.000.

Kennedy, Richard B., to Crehan, Patrick J.; and Fricke, Richard J. Polyurethane foam from cellulosic products. 4,521,544, Cl. 521-107.000.
Keough, Rickey. Electric cart station. 4,520,893, Cl. 180-326.000.
Keppel, Stephen C.; Newton, Donald O.; and Salt, Stephen R., to St. Regis Corporation. Multiwall cooler bag. 4,521,910, Cl. 383-10.000.
Kerimis, Dimitrios; Hombach, Rudolf; Muller, Peter; and Dollhausen, Manfred, to Bayer Aktiengesellschaft. Latent catalysts for the isocyanate polyaddition reaction. 4,521,545, Cl. 521-107.000.
Kernion, Mark C.; and Renkey, Albert L., to Dresser Industries, Inc. Carbon bonded refractories. 4,521,357, Cl. 264-63.000.
Kershner, Larry D., to Dow Chemical Company, The. Preparations of alkanolamines. 4,521,626, Cl. 564-487.000.
Kerth, Randall T.: *See*—
Hayes, Lawrence P., deceased; Hayes, Ellen J., administratrix; Jain, Kantilal; and Kerth, Randall T., 4,521,087, Cl. 350-574.000.
Kessick, Michael A.; George, Zacharia M.; and Schneider, Linda G., to Alberta Research Council. Formation of coke from heavy crude oils in the presence of calcium carbonate. 4,521,382, Cl. 423-68.000.
Kessick, Michael A.; George, Zacharia M.; and Schneider, Linda G., to Alberta Research Council. Lime addition to heavy crude oils prior to coking. 4,521,383, Cl. 423-68.000.
Kester, Ralph C., Jr. Rimless drum structure with tuning device. 4,520,709, Cl. 84-415.000.
Kesting, Marinus C., to Swiss Aluminum Ltd. Process for deposit welding and wear resistant coating alloy. 4,521,663, Cl. 219-76.140.
Key Technology, Inc.: *See*—
Davis, Walter L.; Messenger, Dale; and Randall, Malcolm W., 4,520,702, Cl. 83-71.000.
Kida, Koichi; Aoyama, Tetsuo; and Uchiyama, Takako, to Mitsubishi Gas Chemical Company, Inc. Process for preparation of tertiary olefins. 4,521,638, Cl. 585-640.000.
Kidde, Inc.: *See*—
Walter, Carl W.; and Riordan, William J., 4,521,180, Cl. 431-25.000.
Kienzle Apparate GmbH: *See*—
Schafer, Rolf; Vogelhuber, Peter; and Wysk, Hans-Joachim, 4,521,122, Cl. 400-124.000.
Kiesel, George W.: *See*—
Morris, Robert A.; Kiesel, George W.; and Rajotte, Paul T., 4,521,824, Cl. 361-45.000.
Kieser, Jorg, to Leybold-Heraeus GmbH. Apparatus for producing a microwave plasma for the treatment of substrates, in particular for the plasma-polymerization of monomers thereon. 4,521,717, Cl. 315-39.000.
Kiesewetter, Holger; Myrenne, Heinz; and Roggenkamp, Hans-Gunther. Instrument for measuring the deforming capacity of red blood corpuscles. 4,521,729, Cl. 324-71.100.
Kikuchi, Kenichi: *See*—
Hayashi, Hideki; and Kikuchi, Kenichi, 4,521,888, Cl. 372-50.000.
Killop, James T., to Anderson-Cook, Inc. Fixture for grinding racks. 4,520,540, Cl. 29-90.00B.
Kimball International, Inc.: *See*—
Weil, Robert A., Jr.; and Howell, Stephen L., 4,520,707, Cl. 84-1.030.
Kimber, Geoffrey M.: *See*—
Clarke, James W.; Kimber, Geoffrey M.; Rantell, Terry D.; and Snape, Colin E., 4,521,291, Cl. 208-8.0LE.
Kimishima, Hiroshi: *See*—
Matsuda, Yoshihiro; Kimishima, Hiroshi; and Kado, Yoshikazu, 4,520,932, Cl. 209-545.000.
Kimura, Kazuo; Taneda, Yukinori; Tsuyuki, Shinichi; Suzuki, Shun; Hashimoto, Yoshio; and Sakamoto, Shinichi, to Hitachi Koki Company, Limited. Apparatus for winding coils in electric machinery. 4,520,965, Cl. 242-7.05B.
Kimura, Mamoru: *See*—
Otake, Etsuo; Kimura, Mamoru; Yokota, Hiromu; and Kanematu, Tetuo, 4,521,251, Cl. 106-183.000.
Kimura, Yoshiaki; Nozu, Taketo; and Tanaka, Yasuhiko, to Konishiroku Photo Industry Co., Ltd. Ink jet printing head. 4,521,788, Cl. 346-140.00R.
King, Harold B.; Masaitis, William; Ippisch, Ernest; and Chinn, Albert E., to General Electric Company. Serialization of elongated members. 4,521,862, Cl. 364-552.000.
King, John O., Jr.; and King, John O., III. Flush head blind fastener. 4,521,147, Cl. 411-43.000.
King, John O., III: *See*—
King, John O., Jr.; and King, John O., III, 4,521,147, Cl. 411-43.000.
King, William R.: *See*—
Elliott, Richard E.; and King, William R., 4,521,590, Cl. 528-502.000.
Kinoshita, Hiroshi: *See*—
Hiraki, Shunichi; Kinoshita, Hiroshi; Kumamaru, Kuniaki; Koguchi, Shigeo; and Yonezawa, Toshio, 4,521,256, Cl. 148-1.500.
Kinoshita, Mitsuo; and Obara, Haruki, to Fanuc Ltd. Method of measuring flexure value of wire electrode. 4,521,662, Cl. 219-69.00W.
Kinoshita, Mitsuo, to Fanuc Ltd. Numerical control method. 4,521,721, Cl. 318-573.000.
Kircher, Dieter: *See*—
Belart, Juan; Burgdorf, Jochen; Weise, Lutz; Kircher, Dieter; and Goossens, Andre F. L., 4,521,061, Cl. 303-114.000.
Kircher, Klaus: *See*—
Roos, Ernst; and Kircher, Klaus, 4,521,542, Cl. 521-89.000.
Kirino, Toru: *See*—
Kougami, Akihiko; Mita, Seiichi; Kirino, Toru; and Nagahara, Shusaku, 4,521,816, Cl. 360-45.000.
Kiriyama, Tsutomu: *See*—
Norota, Susumi; Kiriyama, Tsutomu; Imoto, Tadashi; and Azumi, Toshinori, 4,521,364, Cl. 264-176.00F.
Kirsch, Bernd: *See*—
Kretschmer, Horst; Tietze, Guenter; Noack, Juergen; Schweigel, Hans-Joachim; Schingnitz, Manfred; Werner, Klaus; and Kirsch, Bernd, 4,521,139, Cl. 406-19.000.
Kishi, Hirotoshi: *See*—
Katayama, Hajime; Nitanda, Hiroshi; Nagaoka, Tateki; Kishi, Hirotoshi; Takada, Yusaku; Iida, Noriyoshi; Inuzuka, Tsuneki; and Komiya, Yutaka, 4,521,099, Cl. 355-8.000.
Kishimoto, Kazuo: *See*—
Iijima, Tokuzo; Yamamoto, Toshiharu; Kishimoto, Kazuo; Komabashiri, Takamichi; Kano, Toshiji; and Hisanaga, Akinori, 4,521,289, Cl. 204-253.000.
Kisner, Howard D., to General Motors Corporation. High rate sputtering of exhaust oxygen sensor electrode. 4,521,287, Cl. 204-192.0SP.
Kiss, Gunter H. Multilayer fibre mat and process for its production. 4,521,477, Cl. 428-282.000.
Kitajima, Nobuyuki; Tachibana, Yoshinori; Muraki, Asashi; and Kuzuoka, Shinichi, to Toppan Printing Company, Ltd. Method of producing ceramic ware. 4,521,355, Cl. 264-60.000.
Kitano, Kazuaki: *See*—
Harada, Setsuo; Shinagawa, Susumu; and Kitano, Kazuaki, 4,521,340, Cl. 260-245.20T.
Kitchin, Dwight W.; and Manes, Michael R., to Aspen Laboratories, Inc. Automatic tourniquet with improved pressure resolution. 4,520,820, Cl. 128-327.000.
Kiyoshi, Mishima: *See*—
Kunihiko, Ichikawa; and Kiyoshi, Mishima, 4,521,265, Cl. 156-229.000.
Kiyota, Yuhiko; Tsuji, Katsuyuki; Kume, Satoru; Takada, Hiroaki; Shinsei, Kiyoichi; Matsumoto, Akio; and Ogawa, Hitoshi, to Mitsubishi Jiboshia Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Diesel particulate filter system. 4,520,624, Cl. 60-286.000.
Klein, Erwin, to Brown, Boveri & Cie. AG. Power semiconductor component for liquid cooling. 4,521,170, Cl. 357-81.000.
Klein, Gregory L.; and Burton, C. Leonard, to Textron Inc. Air bearing. 4,521,121, Cl. 384-100.000.
Klein, William T. Pollution prevention device. 4,520,852, Cl. 141-86.000.
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Pav, Josef; and Wenzel, Reinhard, 4,520,723, Cl. 100-162.00B.
Klett, Robert J.: *See*—
Spars, Byron G.; Klett, Robert J.; and Wallman, P. Henrik, 4,521,292, Cl. 208-11.00R.
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Christ, Richard; Muller, Erhard; Knackstedt, Hans-Gunther; and Laug, Reiner, 4,521,691, Cl. 250-506.100.
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Knepper, Udo, to Dornier System GmbH. High-resolution, coherent pulse radar. 4,521,778, Cl. 343-13.00R.
Knoblauch, Karl: *See*—
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Knop, Hans-Georg, to Dr.-Ing. Rudolf Hell GmbH. Method of improving contrast accentuation. 4,521,812, Cl. 358-287.000.
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Elsing, John W.; Gorham, Gene F.; and Knopp, Steven D., 4,521,819, Cl. 360-97.000.
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Kobayashi, Fumiaki: *See*—
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Kobiske, Michael H.: *See*—
Adorjan, Jon M.; Kobiske, Michael H.; and Astorino, Michael P., 4,521,002, Cl. 267-8.00R.
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Fukushima, Isao; Kuwahara, Kazuyoshi; Itoigawa, Keiichi; Kobori, Yasunori; and Nishijima, Hideo, 4,521,750, Cl. 333-28.00R.
Koester, Arlan: *See*—
Cushman, Robert L.; Koester, Arlan; and Eveland, Michael, 4,520,960, Cl. 239-29.000.

Koguchi, Shigeo: *See*—
Hiraki, Shunichi; Kinoshita, Hiroshi; Kumamaru, Kuniaki; Koguchi, Shigeo; and Yonezawa, Toshio, 4,521,256, Cl. 148-1.500.
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Candau, Francoise; Leong, Yee-Sing; Kohler, Norbert; and Dawans, Francois, 4,521,317, Cl. 252-8.55D.
Kohli, Dalip K., to American Cyanamid Company. Curable epoxy resin compositions. 4,521,583, Cl. 528-119.000.
Koike, Yasuhiro: *See*—
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Obitsu, Masamichi; Hori, Takahiro; Koinuma, Toyoji; and Sakaguchi, Yuriko, 4,521,249, Cl. 106-12.000.
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Nanjo, Hirotoshi; Satou, Hiroo; and Takahashi, Osamu, 4,520,778, Cl. 123-352.000.
Koloff, Theodora. Analgesic composition. 4,521,411, Cl. 424-195.100.
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Kolta, Rezso: *See*—
Soos, Rudolf; Kolta, Rezso; Zoltan, Sandor; and Tary, Maria, 4,521,612, Cl. 560-124.000.
Komabashiri, Takamichi: *See*—
Iijima, Tokuzo; Yamamoto, Toshiharu; Kishimoto, Kazuo; Komabashiri, Takamichi; Kano, Toshiji; and Hisanaga, Akinori, 4,521,289, Cl. 204-253.000.
Komiya, Yutaka: *See*—
Katayama, Hajime; Nitanda, Hiroshi; Nagaoka, Tateki; Kishi, Hirotoshi; Takada, Yusaku; Iida, Noriyoshi; Inuzuka, Tsuneki; and Komiya, Yutaka, 4,521,099, Cl. 355-8.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Iijima, Toshifumi; and Yamashita, Kiyoshi, 4,521,507, Cl. 430-503.000.
Kimura, Yoshiaki; Nozu, Taketo; and Tanaka, Yasuhiko, 4,521,788, Cl. 346-140.00R.
Konnai, Makoto: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Hosogai, Takeo; and Nishida, Takashi, 4,521,242, Cl. 71-94.000.
Konter, Wolfgang: *See*—
Musch, Rudiger; Gobel, Wilhelm; Konter, Wolfgang; and Nolte, Wilfried, 4,521,576, Cl. 526-213.000.
Kopp, Richard: *See*—
Grogler, Gerhard; and Kopp, Richard, 4,521,338, Cl. 260-239.00A.
Korbacher, Werner: *See*—
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Kornhauser, Murray. Adjustable dough manipulator. 4,521,174, Cl. 425-194.000.
Kosley, Raymond W., Jr.; and Cherill, Robert J., to Hoechst-Roussel Pharmaceuticals Incorporated. Spiro[2H-1,4-benzodioxepin-3(5H)4'-piperidine and -3'-pyrrolidine] compounds and their use as antihypertensive agents. 4,521,537, Cl. 514-302.000.
Koslow, James R., to Miller Special Tools Division Triangle Corporation. Fuel injection cleaning and testing system and apparatus. 4,520,773, Cl. 123-198.00A.
Kosugi, Masao: *See*—
Suzuki, Akiyoshi; Sato, Hirosi; Omata, Takashi; and Kosugi, Masao, 4,521,082, Cl. 350-405.000.
Kougami, Akihiko; Mita, Seiichi; Kirino, Toru; and Nagahara, Shusaku, to Hitachi Denshi Kabushiki Kaisha. Magnetic recording method for digital signal. 4,521,816, Cl. 360-45.000.
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Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; Koumura, Noboru; and Kazuma, Koji, 4,521,805, Cl. 358-75.000.
Kovach, Julius L. Preparation of zirconium phosphate activated carbon adsorbent. 4,521,528, Cl. 502-208.000.
Kowalik, John: *See*—
Vaccaro, Frank E.; and Kowalik, John, 4,521,714, Cl. 313-422.000.
Kowalski, Frank P., to Standex International Corporation. Patient treatment table. 4,520,800, Cl. 128-72.000.
Kozacik, John J. Flow through gas analyzer. 4,521,377, Cl. 422-92.000.
Koziol, Stanislaw; and Sgourakes, George E., to Foxboro Company, The. Small line-size vortex meter. 4,520,678, Cl. 73-861.240.
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Kraft, Wolfgang, to ITT Industries, Inc. Process for manufacturing an integrated insulated-gate field-effect transistor. 4,520,553, Cl. 29-571.000.
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Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, 4,521,889, Cl. 372-87.000.
Muller, Thomas; and Bauer, Rainer, 4,520,673, Cl. 73-623.000.
Kramer & Grebe GmbH & Co. KG: *See*—
Grebe, Reiner; Norbisrath, Max; and Schmidt, Karl-Heinz, 4,520,963, Cl. 241-30.000.
Kramer, Richard L., to General Motors Corporation. Position control mechanism for a vehicle ignition lock. 4,520,640, Cl. 70-248.000.
Kramer, Robert. Tire pressure indicator. 4,520,664, Cl. 73-146.800.
Kratzer, John D. Engine heating system. 4,520,769, Cl. 123-142.50R.
Krauss, Leland L.: *See*—
Benin, Joshua; Delp, Helen R.; and Krauss, Leland L., 4,521,263, Cl. 156-159.000.
Krauth, Axel: *See*—
Keller, Hartmut; Krauth, Axel; and Kriener, Roswitha, 4,521,356, Cl. 264-60.000.
Krech, Thomas D.; and May, David C., to Minnesota Mining and Manufacturing Company. Elastomeric pavement marker having improved configuration. 4,521,129, Cl. 404-10.000.
Krempa, Ted: *See*—
De Cloet, Dan; De Cloet, Ben; and Krempa, Ted, 4,520,579, Cl. 34-204.000.
Krempl, Engelbert: *See*—
Stuhler, Herbert; and Krempl, Engelbert, 4,521,595, Cl. 536-127.000.
Kremser, Harald H.; and Barth, Walter, to Bleistiftmaschinenfabrik Dipl. Ing. Karl Zuber GmbH & Co. KG. Method and apparatus for fastening an eraser to a pencil. 4,520,548, Cl. 29-517.000.
Kretschmer, Horst; Tietze, Guenter; Noack, Juergen; Schweigel, Hans-Joachim; Schingnitz, Manfred; Werner, Klaus; and Kirsch, Bernd, to Brennstoffinstitut Freiberg. Method of regulating mass streams. 4,521,139, Cl. 406-19.000.
Kriechbaum, Karl: *See*—
Eberhardt, Wolfgang; Hoffmann, Dietrich; Kriechbaum, Karl; and Rohde, Erwin, 4,521,654, Cl. 200-146.00R.
Kriel, Wayne A., to Atlantic Richfield Company. Preparation of bis(alpha-alkylbenzyl)ethers. 4,521,636, Cl. 568-659.000.
Kriener, Roswitha: *See*—
Keller, Hartmut; Krauth, Axel; and Kriener, Roswitha, 4,521,356, Cl. 264-60.000.
Kristinsson, Haukur; and Topfl, Werner, to Ciba Geigy Corporation. Process for producing sulfonylureas having a herbicidal action. 4,521,597, Cl. 544-3.000.
Krock, Friedrich W.; and Neoff, Rutger, to Bayer Aktiengesellschaft. Process for the preparation of 1,4-diamino-anthraquinone-2-sulphonic acid. 4,521,341, Cl. 260-371.000.
Kronos Titan - G.m.b.H.: *See*—
Hartmann, Achim; and Thumm, Hans, 4,521,384, Cl. 423-72.000.
Krubsack, Larry J., to Clum Mfg. Co. Inc. Electric solenoid structure. 4,521,758, Cl. 335-131.000.
Kruger, Hans: *See*—
Leenhouts, Frans; and Kruger, Hans, 4,521,079, Cl. 350-339.00R.
Kruger, Sandra J. Facial treatment device. 4,520,799, Cl. 128-67.000.
Krumm, Valentin: *See*—
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Krumpeck, Kurt: *See*—
Lenhard-Backhaus, Hugo; and Krumpeck, Kurt, 4,521,033, Cl. 280-700.000.
Krywchuk, David: *See*—
Haverstock, Wayne; Krywchuk, David; and Masak, Peter, 4,520,683, Cl. 74-41.000.
Kubach, Hans, to Robert Bosch GmbH. Regulating device for the signal of an electromagnetic control element. 4,520,779, Cl. 123-357.000.
Kuck, Karl-Heinz: *See*—
Maurer, Fritz; Brandes, Wilhelm; Kuck, Karl-Heinz; Reinecke, Paul; and Scheinpflug, Hans, 4,521,420, Cl. 514-259.000.
Kudelski, Stefan; and Rosselet, Ernest, to Ampex Corp. Tape driving capstan powered with a permanent magnet motor. 4,521,706, Cl. 310-67.00R.
Kuechler, Thomas C.; Ebner, Jerry R.; and Li, Tao P., to Monsanto Company. Process for oxidation and ammoxidation. 4,521,395, Cl. 423-376.000.
Kuehl, Lawrence J. Apparatus for removing honey frames from supers. 4,520,519, Cl. 6-12.00R.
Kuehnle, Manfred R.; Perry, George J.; and Rose, Robert M., to Coulter Systems Corporation. Electrophotographic image recording method and apparatus. 4,521,097, Cl. 355-3.00R.
Kuekes, Philip J.: *See*—
Rau, Bantwal R.; Glaeser, Christopher D.; and Kuekes, Philip J., 4,521,874, Cl. 365-221.000.
Kuhl, Gunter H.: *See*—
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Kulak, Richard J.: *See*—
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Kumamaru, Kuniaki: *See*—
Hiraki, Shunichi; Kinoshita, Hiroshi; Kumamaru, Kuniaki; Koguchi, Shigeo; and Yonezawa, Toshio, 4,521,256, Cl. 148-1.500.
Kumamoto, Kazuo: *See*—
Nakamoto, Hiromasa; Ogawa, Michitaka; Kobayashi, Muneo; Nogami, Yuki; Kumamoto, Kazuo; Murakami, Hiroko; Ninagawa, Yoichi; Omura, Yoshiaki; and Mizuno, Masao, 4,521,417, Cl. 514-255.000.
Kume, Satoru: *See*—
Kiyota, Yuhiko; Tsuji, Katsuyuki; Kume, Satoru; Takada, Hiroaki; Shinsei, Kiyoichi; Matsumoto, Akio; and Ogawa, Hitoshi, 4,520,624, Cl. 60-286.000.
Kunihiko, Ichikawa; and Kiyoshi, Mishima, to Mitsubishi Light Metal Industries Limited. Process for preparing laminated plate. 4,521,265, Cl. 156-229.000.
Kunihiro, Takatoshi; and Tsuchiya, Koji, to Idemitsu Kosan Company Limited. Process for the production of refrigerator oil. 4,521,296, Cl. 208-87.000.
Kunz, Gary L.: *See*—
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Kuraray Co., Ltd.: *See*—
Nakamoto, Hiromasa; Ogawa, Michitaka; Kobayashi, Muneo; Nogami, Yuki; Kumamoto, Kazuo; Murakami, Hiroko; Ninagawa, Yoichi; Omura, Yoshiaki; and Mizuno, Masao, 4,521,417, Cl. 514-255.000.
Takematsu, Tetsuo; Konnai, Makoto; Hosogai, Takeo; and Nishida, Takashi, 4,521,242, Cl. 71-94.000.

Kurbikoff, Peter A.; and Bethurum, Gary C., to International Telephone and Telegraph Corporation. Electrical connector with optional grounding element. 4,521,062, Cl. 339-14.00R.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Sasaki, Tohru; Endoh, Hiroyuki; and Ohira, Seiichi, 4,521,483, Cl. 428-373.000.

Kurihara, Takashi, to Olympus Optical Co., Ltd. Photographic lens system. 4,521,084, Cl. 350-432.000.

Kurita, Hiroyuki, to Olympus Optical Co., Ltd. Objective for an IC mask testing device. 4,521,086, Cl. 350-464.000.

Kuriu, Sadao: *See*—
Suzuki, Shigeyoshi; Yamada, Jun; Senga, Takao; Kuriu, Sadao; Yamasaki, Masahiro; Hirose, Iwao; and Maegawa, Tokubee, 4,521,101, Cl. 355-10.000.

Kuroki, Yoshifumi: *See*—
Takami, Satoshi; and Kuroki, Yoshifumi, 4,521,094, Cl. 354-423.000.

Kurtz, Leonard D., to Bio Research Inc. Glove molding apparatus and method. 4,521,365, Cl. 264-306.000.

Kuur, Vyacheslav P.: *See*—
Yarygin, Vladimir I.; Sannikov, Jury I.; Panchenko, Anatoly I.; Sychev, Anatoly P.; Vikharev, Ivan G.; Kuur, Vyacheslav P.; and Toguzov, Mels Z., 4,521,245, Cl. 75-21.000.

Kuwabara, Yoshiharu; Hamada, Hiroyoshi; and Kuwata, Masayuki, to Mitutoyo Mfg. Co., Ltd. Optical measuring device with position indicator. 4,521,112, Cl. 356-375.000.

Kuwabara, Yoshiharu; Takayama, Yasuharu; and Hamada, Hiroyoshi, to Mitutoyo Mfg. Co., Ltd. Optical measuring device. 4,521,113, Cl. 356-387.000.

Kuwahara, Kazuyoshi: *See*—
Fukushima, Isao; Kuwahara, Kazuyoshi; Itoigawa, Keiichi; Kobori, Yasunori; and Nishijima, Hideo, 4,521,750, Cl. 333-28.00R.

Kuwahara, Takanori: *See*—
Nishimura, Yasuyuki; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Kuwahara, Takanori; and Tanimoto, Hirotoshi, 4,521,631, Cl. 568-478.000.

Kuwata, Masayuki: *See*—
Kuwabara, Yoshiharu; Hamada, Hiroyoshi; and Kuwata, Masayuki, 4,521,112, Cl. 356-375.000.

Kuzel, Radomir; Broukal, Josef; and Bouse, Vaclav, to Universita Karlova. Mixture for preparation of protective and insulating coatings on metals. 4,521,250, Cl. 106-15.050.

Kuzuoka, Shinichi: *See*—
Kitajima, Nobuyuki; Tachibana, Yoshinori; Muraki, Asashi; and Kuzuoka, Shinichi, 4,521,355, Cl. 264-60.000.

Kyushu Tetsudo Kiki Mfg., Co., Ltd.: *See*—
Hayashi, Mitsuji; Endo, Hideo; Oishibashi, Hirotsugu; Aichi, Takeo; and Sasaki, Shigeru, 4,520,756, Cl. 118-699.000.

Laakso, Oliver A. Pulp thickening utilizing stationary screens. 4,521,315, Cl. 210-784.000.

Laarman, Timothy D.: *See*—
Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., 4,520,757, Cl. 118-723.000.

LaBauve, Raphael J., to Stauffer Chemical Company. Inhalation exposure apparatus. 4,520,808, Cl. 128-200.140.

La Bella, Joseph A.: *See*—
Ranghelli, Joseph C.; and La Bella, Joseph A., 4,521,754, Cl. 333-224.000.

Laboratoire Lucchini S.A.: *See*—
Martin, Michel, 4,521,593, Cl. 536-55.300.

Ladd, Horace W.: *See*—
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Lafferty, James: *See*—
Hagan, John A.; and Lafferty, James, 4,520,941, Cl. 220-72.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
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Laird, James A.: *See*—
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Lambert, Gerard L.: *See*—
Saffer, Gary M.; Lambert, Gerard L.; and Stern, Howard R., 4,521,206, Cl. 446-444.000.

Lambeth, David N., to Eastman Kodak Company. Image sensor and rangefinder device with background subtraction using interlaced analog shift register. 4,521,106, Cl. 356-1.000.

Lammerich, Kurt: *See*—
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Lampietti, Bernard P., to Torin Corporation. Spring coiling machine with improved cut-off means. 4,520,644, Cl. 72-131.000.

Lanier, John H.: *See*—
Carbeau, Richard W.; Martin, James F.; Lanier, John H.; and Holt, William L., 4,520,741, Cl. 110-344.000.

Lansbergen, Gabriel J. T., to Lever Brothers Company. Water-in-oil emulsions. 4,521,440, Cl. 426-602.000.

Lanz, Martin: *See*—
Bednorz, Johannes G.; Hollis, Ralph L., Jr.; Lanz, Martin; Pohl, Wolfgang D.; and Yeack-Scranton, Celia E., 4,520,570, Cl. 33-180.00R.

Lares, Joseph P.; and Cowell, Mark, to Lares Research. Dental handpiece. 4,521,189, Cl. 433-84.000.

Lares Research: *See*—
Lares, Joseph P.; and Cowell, Mark, 4,521,189, Cl. 433-84.000.

Larsson, Raymond P.: *See*—
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Lau, Daniel T.: *See*—
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Laug, Reiner: *See*—
Christ, Richard; Muller, Erhard; Knackstedt, Hans-Gunther; and Laug, Reiner, 4,521,691, Cl. 250-506.100.

Laughman, Lanny M.: *See*—
Chenausky, Peter P.; Mongeon, Robert J.; and Laughman, Lanny M., 4,521,109, Cl. 356-349.000.

Launay, Noel, to Nestec, S. A. Apparatus for decorating confectionery and bakery products. 4,520,705, Cl. 83-879.000.

Laupretre, Jean J.: *See*—
Cholley, Henri E.; Laupretre, Jean J.; and Rollet, Jean, 4,521,072, Cl. 350-96.230.

Laursen, Larry J.; and Prueter, Elton D., to Dow Chemical Company, The. Flanging of plastic lined conduit. 4,520,547, Cl. 29-469.500.

Lausen, Verne H.: *See*—
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Laviolette, Pierre: *See*—
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Lawniczak, Gary P.: *See*—
Holzhauser, Ronald C.; McGlen, James A.; and Lawniczak, Gary P., 4,520,977, Cl. 248-201.000.

Layman, Robert J.: *See*—
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Layrisse, Ignacio: *See*—
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Lear S.n.c. di Foggini & C.: *See*—
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Lebsock, Kenneth L.: *See*—
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Ledis, Stephen L.: *See*—
Carter, James H.; Ledis, Stephen L.; and Crews, Harold R., 4,521,518, Cl. 436-10.000.

Lee, Kiu H.; and Cieloszyk, Gary S., to Union Carbide Corporation. Catalyst impregnated on fine silica, process for preparing, and use for ethylene polymerization. 4,521,573, Cl. 526-125.000.

Leenhouts, Frans; and Kruger, Hans, to Siemens Aktiengesellschaft. Low-reflection liquid-crystal display. 4,521,079, Cl. 350-339.00R.

Lefevre, Didier: *See*—
Coblentz, Andrea; Lefevre, Didier; Colombani, Pascal; and Meunier, Denis, 4,520,666, Cl. 73-155.000.

Lefevre, Marcel R., to Munters Corporation, The. Drainage collection system. 4,521,350, Cl. 261-111.000.

Lehmann, Kurt: *See*—
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Lehmberg, Robert H.: *See*—
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Lehneis, Hans R.; and Wilson, Robert G., to New York University. Artificial limb with automatic release for free rotation. 4,520,512, Cl. 3-22.000.

Lehner, John A.; and Lebsock, Kenneth L., to Ford Aerospace & Communications Corporation. Electronic on-orbit roll/yaw satellite control. 4,521,855, Cl. 364-434.000.

Lemme, Christopher J.; and Frankiewicz, Jeffrey R., to CPC International Inc. Strain of *Clostridium acetobutylicum* and process for its preparation. 4,521,516, Cl. 435-253.000.

Lenhard-Backhaus, Hugo; and Krumpeck, Kurt, to Steyr-Daimler-Puch Aktiengesellschaft. Assembly comprising a frame, unsteered wheels and spring suspension of a motor vehicle. 4,521,033, Cl. 280-700.000.

Lenhart, Ronald A., to Precision Metal Fabricators, Inc. Air transport system. 4,521,130, Cl. 406-86.000.

Lenney, William E.: *See*—
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Lenoir, John: *See*—
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Leonardsson, Per-Erik, to ITT Industries, Inc. Seal device. 4,521,025, Cl. 277-89.000.

Leong, Yee-Sing: *See*—
Candau, Francoise; Leong, Yee-Sing; Kohler, Norbert; and Dawans, Francois, 4,521,317, Cl. 252-8.55D.

Lerman, Max. Cervical collar. 4,520,801, Cl. 128-75.000.

Les Cables de Lyon: *See*—
Vives, Jean-Patrick, 4,521,642, Cl. 174-70.00S.

Letica, Ilija. Apparatus for maintaining uniform wall thickness in hollow molded plastic articles. 4,520,991, Cl. 249-122.000.

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LeVeen, Harry H.; LeVeen, Robert F.; and LeVeen, Eric G., 4,520,823, Cl. 128-348.100.

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Lansbergen, Gabriel J. T., 4,521,440, Cl. 426-602.000.

Levesque, Guy: *See—*
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Levine, Jules D., to Texas Instruments Incorporated. Large area, low temperature process, fault tolerant solar energy converter. 4,521,640, Cl. 136-250.000.

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Price, William E.; Galloway, Louie A., III; Lowrey, Charles B.; and Lewis, Donald R., 4,521,372, Cl. 376-250.000.

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Gilby, Anthony C.; Lewis, Edward L.; and Olsen, Everett O., 4,521,684, Cl. 250-227.000.

Lewis, Tommy K. Self acupressure method. 4,520,798, Cl. 128-24.00R.

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Kieser, Jorg, 4,521,717, Cl. 315-39.000.

Li, George S., to Standard Oil Company, The. Semipermeable membranes prepared from polymers containing pendent sulfone groups. 4,521,224, Cl. 55-16.000.

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Kuechler, Thomas C.; Ebner, Jerry R.; and Li, Tao P., 4,521,395, Cl. 423-376.000.

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Eberhardt, Wolfgang; Hoffmann, Dietrich; Kriechbaum, Karl; and Rohde, Erwin, 4,521,654, Cl. 200-146.00R.

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O'Connor, James M.; and Lickei, Donald L., 4,521,546, Cl. 521-137.000.

Liebel, Gerhard, to Technics GmbH Europa. Ion beam gun. 4,521,719, Cl. 315-111.810.

Liljegren, Leif: *See—*
Scanlan, Harry T.; and Liljegren, Leif, 4,521,674, Cl. 219-299.000.

Liljequist, Lawrence A.; Wible, John E.; and Schwehr, Richard A., to Towmotor Corporation. Suspended seat assembly. 4,520,986, Cl. 248-585.000.

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Yanus, John F.; and Limburg, William W., 4,521,621, Cl. 564-307.000.

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Cramer, Gottfried; and Krumm, Valentin, 4,520,850, Cl. 139-194.000.
John, Heinz, deceased; and John nee Rueffler, Friedlinde, heiress, 4,520,539, Cl. 28-206.000.

Lindberg, Per-Olof, to ASEA Aktiebolag. Grinding u...t for industrial robot and automatic machines. 4,520,597, Cl. 51-134.50R.

Linde Aktiengesellschaft: *See—*
Fuchs, Uwe; and Wildmoser, Alfred, 4,521,311, Cl. 210-616.000.

Lindenmuth, Donald C., to General Motors Corporation. Modular, multi-position arm rest. 4,521,056, Cl. 297-412.000.

Lindsey, Keith E., to Lindsey Manufacturing Company. Instruction kit for use in making feasibility studies for erecting temporary power line supports. 4,521,198, Cl. 434-224.000.

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Salomonsson, Goran; Borjesson, Per O.; Mandersson, Bengt; Holmer, Nils-Gunnar; and Lindstrom, Kjell, 4,520,670, Cl. 73-602.000.

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Shields, Harper; and Lineberry, Roger D., 4,520,635, Cl. 66-185.000.

Link, Edwin A., to RTE Corporation. Submersible primary circuit breaker. 4,521,823, Cl. 361-38.000.

Linklater, Peter M.; and Browning, George W., to Commonwealth of Australia, The. Process for cheese making. 4,521,433, Cl. 426-36.000.

Linkow, Leonard I. Oral implant for oversized dental support openings. 4,521,192, Cl. 433-173.000.

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Borsuk, Gerald M.; Chesson, Edwin E.; Beard, Jerome C.; and Lisle, Thomas K., Jr., 4,521,896, Cl. 377-60.000.

Litman, Ira. Method and apparatus for obtaining the combined aroma of several substances. 4,520,651, Cl. 73-23.000.

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Chiou, George C. Y.; and Liu, Hsin-Kuang, 4,521,414, Cl. 514-229.000.

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Lockhart, Gordon B., to National Research Development Corporation. Simultaneous amplitude and angle modulation using detection of complex zeroes. 4,521,749, Cl. 332-17.000.

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Bizzell, Gary D., 4,520,865, Cl. 165-104.260.

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Mulcahy, Kieran, 4,521,453, Cl. 427-140.000.

Loewrigkeit, Peter: *See—*
Dabi, Shmuel; Loewrigkeit, Peter; and Van Dyk, Kenneth A., 4,521,460, Cl. 427-385.500.

Logan, Russell H.; and Poradish, Frank J., to Texas Instruments Incorporated. Method and apparatus for enhancing radiometric imaging. 4,521,861, Cl. 364-517.000.

Logothetis, Emanuel N., to Kahle Engineering Co. Glass dose syringe. 4,521,237, Cl. 65-42.000.

Loh, William, to Chevron Research Company. 5-C-Alkyl-3-O-arylmethyl or substituted arylmethyl-1,2-O-alkylidene-α-D-xylo-pentodialdofuranose herbicide derivatives. 4,521,240, Cl. 71-88.000.

Lohse, Karl-Heinz, to Lohse, Karl-Heinz. Method of taking angiographs. 4,520,829, Cl. 128-654.000.

Lombardo, Ralph M., Jr.: *See—*
Bruce, Kenneth E.; Lombardo, Ralph M., Jr.; Tarbox, Bruce H.; and Conway, John W., 4,521,848, Cl. 364-200.000.

Long, Charles A., Jr. Remotely controlled hydraulic cleaner apparatus. 4,520,524, Cl. 15-104.30R.

Lord Corporation: *See—*
Rebman, Jack, 4,521,685, Cl. 250-229.000.

Lorenz, Donald H.; Murphy, Edward J.; and Rutherford, John M., Jr., to GAF Corporation. Polymeric hair preparation. 4,521,404, Cl. 424-71.000.

Lorenz, Kurt; Bruns, Engelbert; and Osterholt, Gerd, to Carl Still GmbH & Co. KG, Firma. Apparatus for dry cooling coke. 4,521,279, Cl. 202-227.000.

Lorton, Allen E., Sr. Model construction tool. 4,520,997, Cl. 254-26.00R.

Lothmann, Josef: *See—*
Haissig, Manfred; and Lothmann, Josef, 4,520,860, Cl. 164-415.000.

Lou, Wen C.; and Fulger, Charles V., to General Foods Corporation. Rehydratable rice product. 4,521,436, Cl. 426-104.000.

Loughridge, Fredrick A.: *See—*
Snell, Richard G.; and Loughridge, Fredrick A., 4,521,641, Cl. 174-50.640.

Lovisolo, Pier P.: *See—*
Doria, Gianfederico; Passarotti, Carlo; Lovisolo, Pier P.; and Buttinoni, Ada, 4,521,419, Cl. 514-267.000.

Lowis, Royce: *See—*
Coe, David J.; and Lowis, Royce, 4,521,795, Cl. 357-23.400.

Lowrey, Charles B.: *See—*
Price, William E.; Galloway, Louie A., III; Lowrey, Charles B.; and Lewis, Donald R., 4,521,372, Cl. 376-250.000.

LTH Associates, Ltd.: *See—*
Tamminen, Pentti J., 4,521,497, Cl. 429-27.000.

Lubriquip-Houdaille, Inc.: *See—*
Snow, John P., 4,520,902, Cl. 184-7.400.

Lucas, Howard R., to American Cyanamid Company. Low temperature cure, pigmented coated composition. 4,521,563, Cl. 524-555.000.

Lucas Industries Limited: *See—*
Holroyd, Ralph; and Spiller, Peter O., 4,520,782, Cl. 123-450.000.

Lucia, Carroll J.; and Lucia, George C. Transmission tester. 4,520,659, Cl. 73-118.000.

Lucia, George C.: *See—*
Lucia, Carroll J.; and Lucia, George C., 4,520,659, Cl. 73-118.000.

Lucian, Anton; and Geiger, Kurt, to Aktiengesellschaft Adolph Saurer. Rapier or gripper weaving machine. 4,520,848, Cl. 139-1.00R.

Lucieer, Wouter B.: *See—*
Ouwerkerk, Johannes H. W.; Lucieer, Wouter B.; and Cramer, Rudolph E., 4,521,117, Cl. 366-165.000.

Luddy, Michael A. G.: *See—*
Abbott, Scot D.; and Luddy, Michael A. G., 4,521,521, Cl. 436-517.000.

Ludwig, Walter: *See—*
Arndt, Peter J.; Ludwig, Walter; Munzer, Manfred; Siol, Werner; and Wenzel, Franz, 4,521,567, Cl. 525-261.000.

Luk Lamellen und Kupplungsbau GmbH: *See—*
Maucher, Paul; and Friedmann, Oswald, 4,520,913, Cl. 192-48.800.
Strub, Jean-Claude, 4,520,915, Cl. 192-106.200.
Strub, Jean-Claude, 4,520,916, Cl. 192-106.200.

Lummis, Michael G., to Pacific Atlantic Products, Ltd. Locking and releasing mechanism. 4,520,589, Cl. 43-43.120.

Lumpkins, Rebecca G. Money calculation game. 4,521,197, Cl. 434-110.000.

Lundin, Ingvar: *See—*
Lundin, Per O.; Eriksson, Sven; and Lundin, Ingvar, 4,521,314, Cl. 210-777.000.

Lundin, Per O.; Eriksson, Sven; and Lundin, Ingvar. Method and device for filtering yeast and other plant cell material on rotary vacuum filter. 4,521,314, Cl. 210-777.000.
Lundstroem, Kurt I.: *See*—
Lundstrom, Kurt I.; Arwin, Hans R.; Rieke, Erwin; Sielaff, Gunter; and Hennrich, Norbert, 4,521,522, Cl. 436-525.000.
Lundstrom, Ingemar: *See*—
Bjorklund, Robert; Gustavsson, Hans; Lundstrom, Ingemar; and Nygren, Bertil, 4,521,450, Cl. 427-121.000.
Lundstrom, Kurt I.; Arwin, Hans R.; Rieke, Erwin; Sielaff, Gunter; and Hennrich, Norbert, to Lundstroem, Kurt I. Optical specific binding assay with reflection of polarized electromagnetic radiation. 4,521,522, Cl. 436-525.000.
Lunk, Hans E.: *See*—
Tondre, Stephen L.; and Lunk, Hans E., 4,521,485, Cl. 428-383.000.
Lupa Finances S.A.: *See*—
Hegi, Paul, 4,521,648, Cl. 179-90.00B.
Lupke, Manfred A. A. Apparatus for forming spirally wound pipe. 4,521,270, Cl. 156-429.000.
Lynch, Franklin E.; and Baker, Nathaniel R., to Ergenics Inc. Fuel injection system. 4,520,763, Cl. 123-1.00A.
Lyon, Richard F., to Xerox Corporation. Cursor control device. 4,521,772, Cl. 340-710.000.
Lyon, Richard F., to Xerox Corporation. Imaging array. 4,521,773, Cl. 340-710.000.
Lyons, Gerard E., to Polybottle. Blow moulded plastic containers. 4,520,936, Cl. 215-1.00C.
Lysov, Viktor F.: *See*—
Sevastyanov, Viktor V.; Furman, Yakov A.; Grebenschikov, Anatoly P.; Lysov, Viktor F.; and Shalnov, Boris N., 4,520,826, Cl. 128-422.000.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Fischer, Hermann, 4,520,729, Cl. 101-352.000.
Mabuchi Motor Co. Ltd.: *See*—
Mabuchi, Takaichi, 4,521,710, Cl. 310-234.000.
Mabuchi, Takaichi, to Mabuchi Motor Co. Ltd. Commutator device for miniature motors. 4,521,710, Cl. 310-234.000.
Mace, Michel: *See*—
Miller, Walter G.; Mace, Michel; and Zitterbart, George, 4,520,871, Cl. 169-43.000.
MacElvain, Robert C., to Deep Rock Manufacturing Company, Inc. Ratchet and hydraulic seal assembly for rotating hollow shafts. 4,520,879, Cl. 173-57.000.
Mack Trucks, Inc.: *See*—
Saxman, Edwin F., 4,521,047, Cl. 296-97.00K.
Macko, Joseph E.; and Estriplet, Isnard, to United States of America, Energy. Solids mass flow indication with radiation. 4,520,677, Cl. 73-861.000.
Macnak, Philip P.: *See*—
Smoot, George W.; and Macnak, Philip P., 4,521,776, Cl. 340-825.440.
Macovski, Albert. Pulsed main field nuclear magnetic resonance imaging system. 4,521,734, Cl. 324-313.000.
Maeda, Kunio: *See*—
Hattori, Yoshihiro; Watanabe, Takashi; and Maeda, Kunio, 4,521,488, Cl. 428-409.000.
Maegawa, Tokubee: *See*—
Suzuki, Shigeyoshi; Yamada, Jun; Senga, Takao; Kuriu, Sadao; Yamasaki, Masahiro; Hirose, Iwao; and Maegawa, Tokubee, 4,521,101, Cl. 355-10.000.
Magelky, Bruce F. Row cultivator with structure to inhibit bowing of its frame end to end. 4,520,877, Cl. 172-643.000.
Maggio, Leonard C.: *See*—
Maggio, Richard A.; Maggio, Leonard C.; and Hill, Norman L., 4,520,527, Cl. 15-235.800.
Maggio, Richard A.; Maggio, Leonard C.; and Hill, Norman L. Concrete finishing tool. 4,520,527, Cl. 15-235.800.
Maggiore, Lynne D. Hair cutting guide apparatus and method. 4,520,565, Cl. 30-201.000.
Maglio, Ralph A.; and Fieldhouse, John W., to Firestone Tire & Rubber Company, The. Surface treatment for tack reduction of elastomer surfaces. 4,521,479, Cl. 428-326.000.
Magnetic Information Technology, Inc.: *See*—
Gyi, Ko Ko; and Grewal, Gurbachan S., 4,520,555, Cl. 29-603.000.
Magnetic Peripherals Inc.: *See*—
Elsing, John W.; Gorham, Gene F.; and Knopp, Steven D., 4,521,819, Cl. 360-97.000.
Magnus, George, to Stepan Chemical Company. Polyester polyol blend from phthalic anhydride bottoms. 4,521,611, Cl. 560-91.000.
Magnusson, Hans G.: *See*—
Dahmen, Jan E.; Magnusson, Hans G.; and Martensson, Kaj B., 4,521,592, Cl. 536-4.100.
Mahannah, Daniel H.: *See*—
Moore, George R.; and Mahannah, Daniel H., 4,520,663, Cl. 73-129.000.
Maier, Josef. Device for separably connecting neighboring panels in concrete forms. 4,520,990, Cl. 249-47.000.
Mailfert, Alain: *See*—
Saint-Michel, Jacques A.; Chabrerie, Jean-Pierre; and Mailfert, Alain, 4,521,709, Cl. 310-186.000.
Mainzer, Franz: *See*—
Reichert, Gunter; Mainzer, Franz; Lehmann, Kurt; and Niermann, Hermann, 4,520,631, Cl. 62-188.000.
Maitre, Xavier: *See*—
Petit, Jean-Pierre; and Maitre, Xavier, 4,521,866, Cl. 364-724.000.
Mander, Michael G.: *See*—
Boyd, Malcolm W.; and Mander, Michael G., 4,520,940, Cl. 220-68.000.
Mandersson, Bengt: *See*—
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Manes, Michael R.: *See*—
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Kitchin, Dwight W.; and Manes, Michael R., 4,520,820, Cl. 128-327.000.
Mani, Inder, to Dow Chemical Company, The. Styrene-acrylic latex containing a hetero-unsaturated monomer and paper-coating compositions produced therefrom. 4,521,494, Cl. 428-514.000.
Manner, Reinhard: *See*—
Arntz, Dietrich; Prescher, Gunter; Burkhardt, Werner; Heilos, Johannes; and Manner, Reinhard, 4,521,618, Cl. 562-535.000.
Mannesmann Aktiengesellschaft: *See*—
Flaig, Heinz, 4,520,998, Cl. 254-267.000.
Mansour, Maher L., to Ashland Oil, Inc. Gas curing chamber for flat substrates. 4,520,750, Cl. 118-58.000.
Marais, Lionel, to Compagnie Francaise des Petroles. Rotary drilling tool with percussion device. 4,520,886, Cl. 173-135.000.
Marceau, Aurilien J. Chain saw extension attachment. 4,520,563, Cl. 30-122.000.
Marcinek, John A., to Emhart Industries, Inc. Method of making molecularly oriented plastic bottles. 4,521,369, Cl. 264-532.000.
Maremont Corporation: *See*—
Adorjan, Jon M.; Kobiske, Michael H.; and Astorino, Michael P., 4,521,002, Cl. 267-8.00R.
Marier, Gregory J., to Yamaha Hatsudoki Kabushiki Kaisha. Brake arrangement for snowmobile. 4,520,890, Cl. 180-193.000.
Mariisky Politekhnichesky Institut: *See*—
Sevastyanov, Viktor V.; Furman, Yakov A.; Grebenschikov, Anatoly P.; Lysov, Viktor F.; and Shalnov, Boris N., 4,520,826, Cl. 128-422.000.
Marinoff, Gerald P. Hand supported surgical instrument. 4,520,815, Cl. 128-303.00R.
Maron Products, Inc.: *See*—
Wharton, Donald J., 4,521,146, Cl. 411-1.000.
Mars, Incorporated: *See*—
Hayworth, Lawrence T., 4,521,352, Cl. 264-4.300.
Marsh, Lee M., Jr.: *See*—
Ong, Poen S.; Zermeno, Alfonso; Marsh, Lee M., Jr.; Hevezi, James M.; and Cowart, Ronald W., 4,521,808, Cl. 358-111.000.
Marshall, Charles R., to Dixon Industries Corporation. Double flange sealing member for single action piston pump. 4,521,027, Cl. 277-152.000.
Martel, Jacques; Buendia, Jean; and Nezot, Francois, to Roussel Uclaf. Method of imparting a pleasant odor. 4,521,331, Cl. 252-522.00R.
Martensson, Kaj B.: *See*—
Dahmen, Jan E.; Magnusson, Hans G.; and Martensson, Kaj B., 4,521,592, Cl. 536-4.100.
Marthaler, Hans-Peter, to Dr. von Ballmoos AG. Apparatus for determining the pressure of capillary water, especially in soil. 4,520,657, Cl. 73-73.000.
Martin GmbH fur Umwelt- und Energietechnik: *See*—
Weber, Erich, 4,520,792, Cl. 126-175.000.
Martin, Heino, to Deutsche Babcock Werke Aktiengesellschaft. Forced through-flow steam generator. 4,520,762, Cl. 122-406.0ST.
Martin, James F.: *See*—
Carbeau, Richard W.; Martin, James F.; Lanier, John H.; and Holt, William L., 4,520,741, Cl. 110-344.000.
Martin, Keith F.: *See*—
Mercer, Frank B.; and Martin, Keith F., 4,521,368, Cl. 264-514.000.
Martin, Michel, to Laboratoire Lucchini S.A. Process for obtaining lacto-N-norhexaosyl ceramide. 4,521,593, Cl. 536-55.300.
Martin, Pamela H.: *See*—
Kauffman, William J.; and Martin, Pamela H., 4,521,215, Cl. 8-508.000.
Martinmaas, Werner W. Adjustable socket for socket wrenches. 4,520,698, Cl. 81-128.000.
Marvco Tool & Mfg. Inc.: *See*—
Harrigan, Marvin, 4,520,981, Cl. 248-413.000.
Masaitis, William: *See*—
King, Harold B.; Masaitis, William; Ippisch, Ernest; and Chinn, Albert E., 4,521,862, Cl. 364-552.000.
Masak, Peter: *See*—
Haverstock, Wayne; Krywchuk, David; and Masak, Peter, 4,520,683, Cl. 74-41.000.
Masanek, Jurgen: *See*—
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Maschinenfabrik Hennecke GmbH: *See*—
Althausen, Ferdinand; Proksa, Ferdinand; and Osinski, Ulrich, 4,520,947, Cl. 222-63.000.
Maschinenfabrik Koppern FmbH & Co. KG: *See*—
Blank, Michael G.; and Hammerschmidt, Horst E., 4,521,177, Cl. 425-533.000.
Mascio, Maria R.: *See*—
Anderson, Ronald L.; and Mascio, Maria R., 4,521,254, Cl. 134-26.000.
Masco Corporation of Indiana: *See*—
Baker, William; Smith, Gordon H.; Beach, Xio I.; Sallee, Gary F.; and Stein, Jeffrey I., 4,521,915, Cl. 455-165.000.

Masom, Ronald A., to Smiths Industries Public Limited Company. Optical element having a catalytic coating to promote oxidation of optically-opaque substances. 4,521,088, Cl. 350-582.000.

Mason, Joe; and Eckert, Hermann F., to Baxter Travenol Laboratories, Inc. Method for closing and sealing plastic tubing using a hot die and a rotating cold die. 4,521,366, Cl. 264-312.000.

Masters, William E. Breakaway kayak cockpit and method. 4,520,747, Cl. 114-347.000.

Masuda, Shigeru: *See*—
Okado, Hiroyuki; Masuda, Shigeru; and Mori, Teijiro, 4,521,655, Cl. 200-147.00R.

Matisa (U.K.) Limited: *See*—
Field, Keith C., 4,520,735, Cl. 105-215.00C.

Matrozza, Mark A., to Microlife Technics, Inc. Fermentation method and compositions including a lactobacillus species strain. 4,521,434, Cl. 426-59.000.

Matsubara, Hidenobu: *See*—
Katagiri, Nobuhiko; Matsubara, Hidenobu; and Iida, Akio, 4,520,864, Cl. 165-60.000.

Matsuda, Yoshihiro; Kimishima, Hiroshi; and Kado, Yoshikazu, to Nippon Electric Co., Ltd. Stamp detection in a mail processing apparatus. 4,520,932, Cl. 209-545.000.

Matsufuji, Yohji, to Canon Kabushiki Kaisha. Image forming device. 4,521,785, Cl. 346-25.000.

Matsumoto, Akio; and Yokota, Mitsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Diaphragm apparatus having a magnetically imparted hysteresis characteristic. 4,521,651, Cl. 200-83.00R.

Matsumoto, Akio: *See*—
Kiyota, Yuhiko; Tsuji, Katsuyuki; Kume, Satoru; Takada, Hiroaki; Shinsei, Kiyoichi; Matsumoto, Akio; and Ogawa, Hitoshi, 4,520,624, Cl. 60-286.000.

Matsumoto, Masaaki: *See*—
Uyeda, Takashi; and Matsumoto, Masaaki, 4,521,731, Cl. 324-174.000.

Matsumura, Yasushi: *See*—
Sugisawa, Ko; Matsumura, Yasushi; and Taga, Kazumitsu, 4,520,574, Cl. 34-5.000.

Matsuno, Junichi: *See*—
Yoshida, Takashi; Fujie, Masakatsu; Matsuno, Junichi; and Ouchi, Hideyuki, 4,521,813, Cl. 358-296.000.

Matsuo, Yasushi: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Hirai, Masayoshi; Tanaka, Junzo; and Ueda, Katsuroh, 4,521,183, Cl. 432-37.000.
Hirota, Ken; Fujimoto, Yoshiaki; Watanabe, Kouichi; and Sugimura, Minoru, 4,521,323, Cl. 252-62.590.
Kageyama, Yoshikazu; Nagasaki, Sakon; and Mino, Mineo, 4,521,735, Cl. 324-433.000.
Tamai, Takashi; Tomiyama, Shigefumi; and Ohshima, Nobumasa, 4,520,661, Cl. 73-129.000.

Matsushita, Souichi; Nakanishi, Kiyoshi; and Inoue, Tokuta, to Toyota Jidosha Kabushiki Kaisha. Method of controlling fuel injection and apparatus therefor. 4,520,783, Cl. 123-492.000.

Mattel, Inc.: *See*—
Saffer, Gary M.; Lambert, Gerard L.; and Stern, Howard R., 4,521,206, Cl. 446-444.000.

Matth. Hohner AG: *See*—
Deforeit, Christian J., 4,520,706, Cl. 84-1.100.

Maucher, Paul; and Friedmann, Oswald, to Luk Lamellen und Kupplungsbau GmbH. Device for selectively separating and connecting a rotatable shaft. 4,520,913, Cl. 192-48.800.

Maurer, Fritz; Brandes, Wilhelm; Kuck, Karl-Heinz; Reinecke, Paul; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. Oxoquinazoline carbamates. 4,521,420, Cl. 514-259.000.

Mauser-Werke Oberndorf GmbH: *See*—
Gotz, Udo; Gleichauf, Winifred; and Gunther, Oswin, 4,520,731, Cl. 102-527.000.

May, David C.: *See*—
Krech, Thomas D.; and May, David C., 4,521,129, Cl. 404-10.000.

May, Jim. Log splitter. 4,520,854, Cl. 144-193.00A.

Mayer, Edward F., to Ricoh Company, Ltd. Electrophotographic copying apparatus including specific toner fusing roll and its method of use. 4,521,095, Cl. 355-3.0FU.

Mayes, Thomas L. Iceboard. 4,521,029, Cl. 280-7.140.

Mayo, George L.: *See*—
Dunn, Jimmy L.; Mayo, George L.; and Romeo, Frank C., 4,520,550, Cl. 29-568.000.

Mazin, Moshe; and Engeler, William E., to General Electric Company. CMOS D-type latch employing six transistors and four diodes. 4,521,695, Cl. 307-279.000.

Mazuda, Hiroo: *See*—
Tamehiro, Hiroshi; Mazuda, Hiroo; Ohashi, Mamoru; and Onoe, Yasumitsu, 4,521,258, Cl. 148-12.00F.

McCarter, Ed R., deceased: *See*—
Thatcher, Arthur K.; and McCarter, Ed R., deceased, 4,520,786, Cl. 123-536.000.

McCarter, Rebecca A., executrix: *See*—
Thatcher, Arthur K.; and McCarter, Ed R., deceased, 4,520,786, Cl. 123-536.000.

McCartney, Michael S.; Chadshay, Roman; and Erlacher, Richard F., to Combustion Engineering, Inc. Nozzle tip for pulverized coal burner. 4,520,739, Cl. 110-263.000.

McClure, Maxwell D., III: *See*—
Fachini, Robert M.; Barrett, Monroe C.; and McClure, Maxwell D., III, 4,520,617, Cl. 56-16.600.

McColl, John W.: *See*—
Ferris, Ernest A.; and McColl, John W., 4,520,912, Cl. 192-85.0AA.

McCready, James B. Table tennis game and training apparatus. 4,521,017, Cl. 273-30.000.

McDonald, David I.: *See*—
Holmes, Donald P.; and McDonald, David I., 4,520,575, Cl. 34-23.000.

McDonie, Arthur F.: *See*—
Faulkner, Richard D.; and McDonie, Arthur F., 4,521,715, Cl. 313-531.000.

McDonnell Douglas Corporation: *See*—
Higginbotham, John W.; and Dowden, Dennis C., 4,521,115, Cl. 356-432.000.

McElroy, Arthur H.: *See*—
Cox, Russell C.; and McElroy, Arthur H., 4,521,041, Cl. 285-156.000.

McGary, Charles W.: *See*—
Solomon, Donald D.; McGary, Charles W.; and Pascarella, Vincent J., 4,521,564, Cl. 525-54.100.

McGlen, James A.: *See*—
Holzhauser, Ronald C.; McGlen, James A.; and Lawniczak, Gary P., 4,520,977, Cl. 248-201.000.

McIlvin, Donald B.: *See*—
Bouzianis, George J.; and McIlvin, Donald B., 4,521,176, Cl. 425-521.000.

McInnes, Robert. Cathode structure for cleaning, plating and/or coating apparatus. 4,521,288, Cl. 204-213.000.

McInnis, Donald E. Hanger and method for suspending a television. 4,520,979, Cl. 248-323.000.

McKenna, James M., to Du Pont de Nemours, E. I., and Company. Flame retardant copolyetheresters. 4,521,557, Cl. 524-94.000.

McKinney, Benjamin F., to Oxide & Chemical Corporation. Method and apparatus for the production of lead oxide. 4,521,399, Cl. 423-620.000.

McMichael, John, to McMichael, John. Methods and materials for treatment of disease states involving immunological factors. 4,521,405, Cl. 424-92.000.

McVie, James; and Butler, Derek W., to Dow Corning Limited. Siloxane-polyester compositions. 4,521,461, Cl. 427-387.000.

Mead Corporation, The: *See*—
Muller, Rolf, 4,520,612, Cl. 53-48.000.

Medical Engineering Corporation: *See*—
Weeks, Vaughan B., 4,520,814, Cl. 128-303.100.

Medosan Industrie Biochimiche Riunite S.p.A.: *See*—
Baglioni, Alessandro, 4,521,538, Cl. 514-423.000.

Medtronic, Inc.: *See*—
Thompson, David L.; Roline, Glenn M.; and Harrington, Richard J., 4,520,825, Cl. 128-422.000.

Medwed, Emmerich, to Multivac Sepp Haggenmuller KG. Apparatus for producing containers from thermoplastic sheet material. 4,521,175, Cl. 425-403.000.

Meggs, Daniel H.; Gross, Herbert G.; and Greenslade, John T., to Gulf & Western. Flexible elongated lighting system. 4,521,835, Cl. 362-183.000.

Mehnert, Walter: *See*—
Chaborski, Hoiko; and Mehnert, Walter, 4,521,107, Cl. 356-5.000.

Meisenheimer, William L.: *See*—
Van Peski, Christian K.; and Meisenheimer, William L., 4,521,114, Cl. 356-401.000.

Mellon, Andrew M.: *See*—
Parkyn, William A.; Ladd, Horace W.; and Mellon, Andrew M., 4,520,795, Cl. 126-443.000.

Melocik, Grant C.; and Pickering, William, to Towmotor Corporation. Diagnostic display apparatus. 4,521,885, Cl. 371-29.000.

Melvin, Larry E. Rotating wheel dresser. 4,520,788, Cl. 125-11.0CD.

Menezes, Edgar V.; and Steinheuser, Peter, to Ethicon, Inc. Ethylene-propylene copolymer sutures. 4,520,822, Cl. 128-335.500.

Mercer, Frank B.; and Martin, Keith F., to Netlon Limited. Method of making internally cross-ribbed plastics material structure. 4,521,368, Cl. 264-514.000.

Mercer, James D.; and Aaserude, Gordon. Bi-axial orthotic device. 4,520,802, Cl. 128-80.00C.

Merck & Co., Inc.: *See*—
Stapley, Edward O., 4,521,408, Cl. 424-115.000.

Merrell, Richard G., to Zenith Electronics Corporation. Apparatus for synchronizing the operation of master and slave counters. 4,521,897, Cl. 377-115.000.

Merrill, Duane F., to General Electric Company. Processes and articles for removing typewriter inks. 4,521,471, Cl. 428-40.000.

Messenger, Dale: *See*—
Davis, Walter L.; Messenger, Dale; and Randall, Malcolm W., 4,520,702, Cl. 83-71.000.

Metallgesellschaft AG: *See*—
Alig, Franz; Hemmerling, Horst; and Neulinger, Franz, 4,521,226, Cl. 55-21.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Daar, Horst; and Alig, Franz, 4,521,223, Cl. 55-13.000.
Daar, Horst; and Alig, Franz, 4,521,228, Cl. 55-105.000.

Metzler, Steven, to National Keystone Products Co. Dowel pin for dental models. 4,521,188, Cl. 433-74.000.

Meunier, Denis: *See*—
Coblentz, Andrea; Lefevre, Didier; Colombani, Pascal; and Meunier, Denis, 4,520,666, Cl. 73-155.000.

Meurer NonFood Product GmbH: *See—*
Vossen, Franz, 4,521,233, Cl. 55-384.000.
Meyer, Hermann: *See—*
Ziemek, Gerhard; Schatz, Friedrich; and Meyer, Hermann, 4,520,622, Cl. 57-59.000.
Meyer, Lawrence L.; and Carli, Alvin J., to Alliance Manufacturing Company, Inc., The. Tape drive closure operator. 4,520,684, Cl. 74-89.210.
Meyer, Norbert; Zeeh, Bernd; Buschmann, Ernst; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Vinylazoles and their use for controlling fungi. 4,521,429, Cl. 514-383.000.
Mezhkhozyai Stvennoe Opytnokonstruktorskoe Bjuro Mariiskogo Respublicanskogo Proizvodstvennogo Obiedinenia "Mariiskmezhkhozkombikorm": *See—*
Sevastyanov, Viktor V.; Furman, Yakov A.; Grebenschikov, Anatoly P.; Lysov, Viktor F.; and Shalnov, Boris N., 4,520,826, Cl. 128-422.000.
Michel, Robert, to Renault Vehicules Industriels. Hydropneumatic energy reservoir for accumulating the braking energy recovered on a vehicle. 4,520,840, Cl. 137-259.000.
Micheron, Francois: *See—*
Broussoux, Dominique; Facoetti, Hugues; Micheron, Francois; and Monnerie, Lucien, 4,521,322, Cl. 252-62.900.
Mickiewicz, Stanley, to Codman & Shurtleff, Inc. High dielectric output circuit for electrosurgical power source. 4,520,818, Cl. 128-303.170.
Microlife Technics, Inc.: *See—*
Matrozza, Mark A., 4,521,434, Cl. 426-59.000.
Micronix Partners: *See—*
Braun, Martin, 4,521,903, Cl. 378-141.000.
Mid-West Automation Inc.: *See—*
Eitzinger, Robert, 4,520,682, Cl. 74-40.000.
Midorikawa, Minoru, to Nissan Motor Co., Ltd. Intake air heating system for an internal combustion engine. 4,520,787, Cl. 123-556.000.
Mifune, Hiroyuki: *See—*
Sugimoto, Tadao; Ikeda, Hideo; Mifune, Hiroyuki; and Nakamura, Koki, 4,521,508, Cl. 430-567.000.
Mikami, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Hooper door opening mechanism for automatic weighing apparatus. 4,520,884, Cl. 177-58.000.
Miki, Isao; and Kawai, Toshiyuki, to Nippon Light Metal Co., Ltd. Method for producing profiled product having fins. 4,520,541, Cl. 29-156.8CF.
Mikumo, Masatoshi: *See—*
Toaba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, 4,521,565, Cl. 525-64.000.
Milc, Thomas A., to Mitel Corporation. Printed circuit board lock. 4,521,063, Cl. 339-17.0LM.
Miller, Clarence W., to Thermetic Glass, Inc. Multi-pane sealed window and method for forming same. 4,520,602, Cl. 52-173.00R.
Miller Electric Manufacturing Company: *See—*
Fronius, Klaus, 4,521,671, Cl. 219-130.310.
Fronius, Klaus, 4,521,672, Cl. 219-130.330.
Miller, Glen E., to Boeing Company, The. Pressure-actuated optical switch. 4,521,683, Cl. 250-221.000.
Miller, Henry L., to Miller Screen & Design, Inc. Method and apparatus for silk-screen printing. 4,520,727, Cl. 101-127.000.
Miller, Larry. Splint and method of using same. 4,520,806, Cl. 128-87.00R.
Miller, Robert F., to Teledyne, Inc. Process and apparatus for surfacing with high deposition and low dilution. 4,521,664, Cl. 219-76.140.
Miller Screen & Design, Inc.: *See—*
Miller, Henry L., 4,520,727, Cl. 101-127.000.
Miller Special Tools Division Triangle Corporation: *See—*
Koslow, James R., 4,520,773, Cl. 123-198.00A.
Miller, Walter G.; Mace, Michel; and Zitterbart, George, to Wormald Fire Systems, Inc. Fire extinguishing system. 4,520,871, Cl. 169-43.000.
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., to Occidental Chemical Agricultural Products, Inc. Process for blending phosphoric acids of differing impurity content. 4,521,392, Cl. 423-317.000.
Milora, David J., to Pennwalt Corporation. Highly alkaline cleaning dispersion. 4,521,332, Cl. 252-527.000.
Minagawa, Shoichi: *See—*
Okamoto, Takeshi; and Minagawa, Shoichi, 4,521,711, Cl. 310-313.00B.
Mine Support Systems (Proprietary) Ltd.: *See—*
Townsend, Rodney C., 4,520,980, Cl. 248-351.000.
Minnesota Mining and Manufacturing Company: *See—*
Bernard, Samuel, Jr., 4,521,644, Cl. 179-2.0DP.
Graham, Joseph; Gennrich, Timothy J.; and Laird, James A., 4,521,333, Cl. 252-606.000.
Herbert, Alan J., 4,521,503, Cl. 430-49.000.
Krech, Thomas D.; and May, David C., 4,521,129, Cl. 404-10.000.
Pocius, Alphonsus V.; and Schultz, William J., 4,521,490, Cl. 428-416.000.
Wulfing, James J.; and Rood, Robert M., 4,520,969, Cl. 242-71.800.
Mino, Mineo: *See—*
Kageyama, Yoshikazu; Nagasaki, Sakon; and Mino, Mineo, 4,521,735, Cl. 324-433.000.
Miranda, Giovanna F.: *See—*
Nisato, Dino; Frigerio, Marco; and Miranda, Giovanna F., 4,521,428, Cl. 514-277.000.
Mississippi Chemical Corporation: *See—*
Simms, Douglas P.; and Dobbs, Joseph M., 4,521,239, Cl. 71-27.000.
Mita Industrial Co., Ltd.: *See—*
Motomura, Minoru; Shibata, Kiyoshi; Watanabe, Toshio; and Ohata, Yousuke, 4,521,102, Cl. 355-14.0CU.
Mita, Seiichi: *See—*
Kougami, Akihiko; Mita, Seiichi; Kirino, Toru; and Nagahara, Shusaku, 4,521,816, Cl. 360-45.000.
Mitchell, Peter W. D., to Union Camp Corporation. Separation of 1,8-cineole by forming a complex with hydroquinone. 4,521,608, Cl. 549-397.000.
Mitchell, Peter W. D., to Union Camp Corporation. Method of preparing alkali metal salts of organic diamines. 4,521,627, Cl. 564-511.000.
MITEC Moderne Industrietechnik GmbH: *See—*
Chaborski, Hoiko; and Mehnert, Walter, 4,521,107, Cl. 356-5.000.
Mitel Corporation: *See—*
Milc, Thomas A., 4,521,063, Cl. 339-17.0LM.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Kiyota, Yuhiko; Tsuji, Katsuyuki; Kume, Satoru; Takada, Hiroaki; Shinsei, Kiyoichi; Matsumoto, Akio; and Ogawa, Hitoshi, 4,520,624, Cl. 60-286.000.
Matsumoto, Akio; and Yokota, Mitsuyoshi, 4,521,651, Cl. 200-83.00R.
Niino, Shuheu; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, 4,520,642, Cl. 72-8.000.
Nishida, Minoru, 4,520,781, Cl. 123-414.000.
Ogawa, Hitoshi, 4,521,169, Cl. 418-69.000.
Okado, Hiroyuki; Masuda, Shigeru; and Mori, Teijiro, 4,521,655, Cl. 200-147.00R.
Sasao, Isao, 4,520,905, Cl. 187-29.00R.
Shinohara, Hirofumi; Tomisawa, Osamu; Anami, Kenji; and Yoshimoto, Masahiko, 4,521,704, Cl. 307-530.000.
Tatsumi, Takumi, 4,520,680, Cl. 73-862.190.
Watanabe, Eiki, 4,520,906, Cl. 187-29.00R.
Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,521,653, Cl. 200-144.00C.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Kida, Koichi; Aoyama, Tetsuo; and Uchiyama, Takako, 4,521,638, Cl. 585-640.000.
Mitsubishi Jiboshia Kogyo Kabushiki Kaisha: *See—*
Kiyota, Yuhiko; Tsuji, Katsuyuki; Kume, Satoru; Takada, Hiroaki; Shinsei, Kiyoichi; Matsumoto, Akio; and Ogawa, Hitoshi, 4,520,624, Cl. 60-286.000.
Mitsubishi Light Metal Industries Limited: *See—*
Kunihiko, Ichikawa; and Kiyoshi, Mishima, 4,521,265, Cl. 156-229.000.
Mitsubishi Paper Mills, Ltd.: *See—*
Suzuki, Shigeyoshi; Yamada, Jun; Senga, Takao; Kuriu, Sadao; Yamasaki, Masahiro; Hirose, Iwao; and Maegawa, Tokubee, 4,521,101, Cl. 355-10.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
Ichimura, Mitsunori; Yamamoto, Ryoichi; and Horimoto, Katsutoshi, 4,521,378, Cl. 422-135.000.
Mitsui Toatsu Kagaku Kabushiki Kaisha: *See—*
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,521,415, Cl. 514-252.000.
Mitsuno, Tatsuyuki; and Yamamoto, Masashi, to Sumitomo Chemical Company, Limited. Particulate polyolefin expansion molding material. 4,521,487, Cl. 428-407.000.
Mittelstaedt, Wolfgang: *See—*
Finkenzeller, Johann; and Mittelstaedt, Wolfgang, 4,521,899, Cl. 378-40.000.
Mitutoyo Mfg. Co., Ltd.: *See—*
Kuwabara, Yoshiharu; Hamada, Hiroyoshi; and Kuwata, Masayuki, 4,521,112, Cl. 356-375.000.
Kuwabara, Yoshiharu; Takayama, Yasuharu; and Hamada, Hiroyoshi, 4,521,113, Cl. 356-387.000.
Miura, Kazunori; Hattori, Yoshinori; and Matsuo, Yasushi, to Agency of Industrial Science & Technology. Process for the production of silicon nitride sintered bodies. 4,521,358, Cl. 264-65.000.
Miyagi, Hideo: *See—*
Ito, Yoshiyasu; Kobayashi, Fumiaki; and Miyagi, Hideo, 4,520,780, Cl. 123-359.000.
Miyaji, Naotaka; Sakamoto, Atsushi; and Iwahara, Makoto, to Victor Company of Japan, Limited. Phased-array sound pickup apparatus having no unwanted response pattern. 4,521,908, Cl. 381-92.000.
Miyake, Akio: *See—*
Oka, Yoshikazu; Nishikawa, Kohei; and Miyake, Akio, 4,521,607, Cl. 549-39.000.
Miyake, Akira. Process of manufacturing a sleeve and wedge for an anchor bolt. 4,520,521, Cl. 10-27.0PH.
Miyake, Kiyoshi; and Kaneko, Hiroko, to Ricoh Company, Ltd. Electrochromic display device. 4,521,081, Cl. 350-357.000.
Miyake, Toshio; Sakai, Shuzo; and Shibuya, Takashi, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Process for producing a high-purity isomaltose. 4,521,252, Cl. 127-46.300.
Mizoguchi, Kiyohisa: *See—*
Kanematsu, Hiroyuki; Nagae, Akimitsu; Mizoguchi, Kiyohisa; and Ohashi, Hajime, 4,521,860, Cl. 364-474.000.
Mizrahi, Sadi: *See—*
Angevine, Philip J.; Kuhl, Gunter H.; and Mizrahi, Sadi, 4,521,297, Cl. 208-89.000.
Mizuno, Masao: *See—*
Nakamoto, Hiromasa; Ogawa, Michitaka; Kobayashi, Muneo; Nogami, Yuki; Kumamoto, Kazuo; Murakami, Hiroko; Ninagawa, Yoichi; Omura, Yoshiaki; and Mizuno, Masao, 4,521,417, Cl. 514-255.000.

Mizushima, Yoshihiko: *See*—
Murase, Katsumi; and Mizushima, Yoshihiko, 4,521,794, Cl. 357-2.000.
Moberg, Kurt E. L. Device for simulating the report effect of a blank cartridge when firing small arms. 4,521,195, Cl. 434-16.000.
Mobil Oil Corporation: *See*—
Anderson, James J., 4,521,547, Cl. 521-137.000.
Angevine, Philip J.; Kuhl, Gunter H.; and Mizrahi, Sadi, 4,521,297, Cl. 208-89.000.
Rosinski, Edward J.; and Schwartz, Albert B., 4,521,298, Cl. 208-120.000.
Moeller, John D. Portable tent. 4,520,835, Cl. 135-102.000.
Moetteli, John B. Ratchet wrench. 4,520,697, Cl. 81-62.000.
Moffat, Richard P., to Saskatchewan Power Corporation. Overspeed-/underspeed detector. 4,521,894, Cl. 377-16.000.
Moisan, Louis E. Audible and bi-visual indicator. 4,520,586, Cl. 43-17.000.
Molloy, Lawrence. Bathroom radio. 4,521,919, Cl. 455-344.000.
Momono, Masakichi; Moriya, Hisanori; Souma, Masahiro; and Hamashima, Eiji, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Magnetic fuel injection valve. 4,520,962, Cl. 239-585.000.
Monarch Marking Systems, Inc.: *See*—
Jacobson, David N., 4,521,267, Cl. 156-249.000.
Mongeon, Robert J.: *See*—
Chenausky, Peter P.; Mongeon, Robert J.; and Laughman, Lanny M., 4,521,109, Cl. 356-349.000.
Monnerie, Lucien: *See*—
Broussoux, Dominique; Facoetti, Hugues; Micheron, Francois; and Monnerie, Lucien, 4,521,322, Cl. 252-62.900.
Monsanto Company: *See*—
Kuechler, Thomas C.; Ebner, Jerry R.; and Li, Tao P., 4,521,395, Cl. 423-376.000.
Tou, Jacob S.; and Schleppnik, Alfred A., 4,521,344, Cl. 260-465.00D.
Montedison S.p.A.: *See*—
Galli, Paolo; and Spataro, Mario, 4,521,566, Cl. 525-247.000.
Montedoro-Whitney Corporation: *See*—
Palmer, David A.; and Palmer, James K., 4,520,650, Cl. 73-3.000.
Moore, Eddie C.: *See*—
Moore, Jeff D.; Moore, Eddie C.; Tucker, Burnis H.; and Goodwill, William P., 4,520,681, Cl. 73-862.280.
Moore, George R.; and Mahannah, Daniel H., to General Motors Corporation. Vehicle brake test apparatus. 4,520,663, Cl. 73-129.000.
Moore, Jeff D.; Moore, Eddie C.; Tucker, Burnis H.; and Goodwill, William P., to Moore, Jeff D.; and Moore, Eddie C. Apparatus for measuring torque on a rotating shaft. 4,520,681, Cl. 73-862.280.
Moraly, Paul. Method for manufacturing pins particularly intended for anchoring in the ground posts or stakes, and pins obtained thereby. 4,520,545, Cl. 29-412.000.
Mori, Fumio: *See*—
Itsubo, Junichi; Yazaki, Takashi; and Mori, Fumio, 4,520,939, Cl. 215-252.000.
Mori, Kyoichiro; and Hirano, Hiroyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Sequentially produced multilayer acrylic resin composition. 4,521,568, Cl. 525-309.000.
Mori, Shigeo: *See*—
Fujita, Takeshi;; Mori, Shigeo; Kataoka, Hironori; and Taniuchi, Akira, 4,521,586, Cl. 528-297.000.
Mori, Takaro: *See*—
Sasamura, Kohhei; and Mori, Takaro, 4,521,817, Cl. 360-46.000.
Mori, Teijiro: *See*—
Okado, Hiroyuki; Masuda, Shigeru; and Mori, Teijiro, 4,521,655, Cl. 200-147.00R.
Morimoto, Masao; Sano, Shoji; Yoshimi, Kazuyoshi; and Saitou, Kazuo, to Sanyo Electric Co., Ltd. Blower and rotating wind deflector. 4,521,153, Cl. 415-146.000.
Morita, Toyoo; and Horikawa, Yoichi, to Yoshida Kogyo K. K. Method of and apparatus for automatically finishing slide fasteners. 4,520,544, Cl. 29-408.000.
Moriya, Hisanori: *See*—
Momono, Masakichi; Moriya, Hisanori; Souma, Masahiro; and Hamashima, Eiji, 4,520,962, Cl. 239-585.000.
Morris, Robert A.; Kiesel, George W.; and Rajotte, Paul T., to General Electric Company. Interrupter mechanism for a ground fault circuit interrupter. 4,521,824, Cl. 361-45.000.
Morse, Albert I.; Crowell, Douglas H.; and Gilligan, Thomas J., III, to USM Corporation. Receiving belt mechanism. 4,520,751, Cl. 118-203.000.
Moss, William H.; and Scheib, Thomas J., to Babcock & Wilcox Company, The. Program timer control. 4,521,869, Cl. 364-900.000.
Mostek Corporation: *See*—
Taylor, Ronald T., 4,521,698, Cl. 307-450.000.
Motomura, Minoru; Shibata, Kiyoshi; Watanabe, Toshio; and Ohata, Yousuke, to Mita Industrial Co., Ltd. Copy paper counting method and device for copying apparatus. 4,521,102, Cl. 355-14.0CU.
Motorola, Inc.: *See*—
Akram, M. Faheem, 4,521,898, Cl. 377-116.000.
Budnik, Brian J., 4,521,726, Cl. 323-283.000.
Bynum, Byron G., 4,521,737, Cl. 330-51.000.
Davies, Robert B., 4,521,799, Cl. 357-51.000.
Flowers, Dervin L., 4,521,441, Cl. 427-38.000.
Joseph, Eric D., 4,521,697, Cl. 307-355.000.
Raghunathan, Kuppuswamy, 4,521,696, Cl. 307-350.000.
Smoot, George W.; and Macnak, Philip P., 4,521,776, Cl. 340-825.440.
Mouille , Bernhard; and Durand, Michel, to Compagnie Francaise de l'Azote Cofaz. Continuous process and equipment for the recovery of nitrogen oxides from nitrous gases. 4,521,390, Cl. 423-239.000.
Moulin, Blaise, to Caracteres S.A. Characters carrying print wheel disc for printing machine and method of manufacturing same. 4,521,124, Cl. 400-144.200.
Mowdood, Syed K., to Goodyear Tire & Rubber Company, The. Rubber-metal adhesion promoters. 4,521,558, Cl. 524-145.000.
Moy, Harold: *See*—
Braun, Derrek E.; Lau, Daniel T.; and Moy, Harold, 4,521,712, Cl. 310-339.000.
Moyer, Ted A.: *See*—
Sucro, Jost S.; Moyer, Ted A.; and Shufflebarger, William S., 4,520,689, Cl. 74-595.000.
MSI Electronics Inc.: *See*—
Shulman, Carl, 4,521,730, Cl. 324-158.00F.
Mueller, Martin, to Osgood Industries, Inc. Method and apparatus for internally cutting a tube of material. 4,521,264, Cl. 156-184.000.
Mukae, Toshiyuki; and Azuma, Yoshifumi, to Noritsu Kenkyu Center Co., Ltd. Negative film carrier for a disc film. 4,521,105, Cl. 355-64.000.
Mulcahy, Kieran, to Loctite (Ireland) Ltd. Heating/cooling coil sealing. 4,521,453, Cl. 427-140.000.
Muller, Bernhard: *See*—
Gevatter, Hans-Jurgen; Muller, Bernhard; and Neese, Hans-Joachim, 4,521,257, Cl. 148-11.50Q.
Muller, Erhard: *See*—
Christ, Richard; Muller, Erhard; Knackstedt, Hans-Gunther; and Laug, Reiner, 4,521,691, Cl. 250-506.100.
Muller, Peter: *See*—
Kerimis, Dimitrios; Hombach, Rudolf; Muller, Peter; and Dollhausen, Manfred, 4,521,545, Cl. 521-107.000.
Muller, Reinhard: *See*—
Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, 4,521,889, Cl. 372-87.000.
Muller, Rolf, to Mead Corporation, The. Packaging machine. 4,520,612, Cl. 53-48.000.
Muller, Thomas; and Bauer, Rainer, to Kraftwerk Union Aktiengesellschaft. Inspection device, especially for steam generator tubes. 4,520,673, Cl. 73-623.000.
Multani, Jagir S.: *See*—
Rajkanan, Kamal; and Multani, Jagir S., 4,521,796, Cl. 357-23.500.
Multivac Sepp Haggenmuller KG: *See*—
Medwed, Emmerich, 4,521,175, Cl. 425-403.000.
Mundnich, Rainer: *See*—
Finke, Manfred; and Mundnich, Rainer, 4,521,348, Cl. 260-940.000.
Munters Corporation, The: *See*—
Lefevre, Marcel R., 4,521,350, Cl. 261-111.000.
Munzel, Wolf-Dietrich: *See*—
Andres, Rudolf; Grantz, Helmut; Munzel, Wolf-Dietrich; and Odebrecht, Wolfgang, 4,520,863, Cl. 165-48.00R.
Munzer, Manfred: *See*—
Arndt, Peter J.; Ludwig, Walter; Munzer, Manfred; Siol, Werner; and Wenzel, Franz, 4,521,567, Cl. 525-261.000.
Murakami, Hiroko: *See*—
Nakamoto, Hiromasa; Ogawa, Michitaka; Kobayashi, Muneo; Nogami, Yuki; Kumamoto, Kazuo; Murakami, Hiroko; Ninagawa, Yoichi, Omura, Yoshiaki; and Mizuno, Masao, 4,521,417, Cl. 514-255.000.
Murakami, Kazuhito; and Takahashi, Kenichi, to Sumitomo Electric Industries, Ltd. Infrared light transmitting fiber and process for producing the same. 4,521,073, Cl. 350-96.340.
Murakami, Toshiaki; Enomoto, Yoichi; and Inamura, Takahiro, to Nippon Telegraph & Telephone Public Corporation. Photodetecting device having Josephson junctions. 4,521,682, Cl. 250-211.00J.
Muraki, Asashi: *See*—
Kitajima, Nobuyuki; Tachibana, Yoshinori; Muraki, Asashi; and Kuzuoka, Shinichi, 4,521,355, Cl. 264-60.000.
Muralidhara, Ranya: *See*—
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,521,613, Cl. 560-152.000.
Murao, Yutaka; and Nishizono, Taira, to Tokyo Shibaura Denki Kabushiki Kaisha. A-D Converter and method of A-D conversion. 4,521,763, Cl. 340-347.0AD.
Murase, Katsumi; and Mizushima, Yoshihiko, to Nippon Telegraph & Telephone Public Corporation. Electrode and semiconductor device provided with the electrode. 4,521,794, Cl. 357-2.000.
Murata, Shirou: *See*—
Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,521,653, Cl. 200-144.00C.
Murauchi, Akitsugu: *See*—
Uemura, Masayuki; Murauchi, Akitsugu; and Izushi, Takehiro, 4,521,020, Cl. 273-85.00G.
Murdock, David L.: *See*—
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., 4,521,392, Cl. 423-317.000.
Murphey, Joseph R., to Halliburton Company. Rapidly dissolvable silicates and methods of using the same. 4,521,136, Cl. 405-263.000.
Murphy, Alan S., to International Business Machines Corporation. Raster CRT having balanced pel distribution for flicker reduction. 4,521,774, Cl. 340-745.000.
Murphy, Edward J.: *See*—
Lorenz, Donald H.; Murphy, Edward J.; and Rutherford, John M., Jr., 4,521,404, Cl. 424-71.000.

Musch, Rudiger; Gobel, Wilhelm; Konter, Wolfgang; and Nolte, Wilfried, to Bayer Aktiengesellschaft. Continuous polymerization of chloroprene. 4,521,576, Cl. 526-213.000.

Myers, Kimbrough I.: *See—*
Granzow, Robert H.; Gupta, Desh B.; Myers, Kimbrough I.; and Filliman, Mark D., 4,521,008, Cl. 271-3.000.

Myers, Terry D.: *See—*
Myers, William D.; and Myers, Terry D., 4,521,194, Cl. 433-215.000.

Myers, William D.; and Myers, Terry D. Method for removing incipient carious lesions and/or stain from teeth. 4,521,194, Cl. 433-215.000.

Myrenne, Heinz: *See—*
Kiesewetter, Holger; Myrenne, Heinz; and Roggenkamp, Hans-Gunther, 4,521,729, Cl. 324-71.100.

Nablo, Sam V.; and Tripp, Edwin P., III, to Energy Sciences, Inc. Method and apparatus for electron curing on a cooled drum. 4,521,445, Cl. 427-44.000.

NAD Holding Limited: *See—*
Edvardsen, Erik, 4,521,742, Cl. 330-289.000.

Nagae, Akimitsu: *See—*
Kanematsu, Hiroyuki; Nagae, Akimitsu; Mizoguchi, Kiyohisa; and Ohashi, Hajime, 4,521,860, Cl. 364-474.000.

Nagahara, Shusaku: *See—*
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Nagao, Makoto; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,521,481, Cl. 428-336.000.

Nagao, Taku: *See—*
Oh-ishi, Tokuro; Takeda, Mikio; Nakajima, Hiromichi; and Nagao, Taku, 4,521,430, Cl. 514-211.000.

Nagaoka, Tateki: *See—*
Katayama, Hajime; Nitanda, Hiroshi; Nagaoka, Tateki; Kishi, Hirotoshi; Takada, Yusaku; Iida, Noriyoshi; Inuzuka, Tsuneki; and Komiya, Yutaka, 4,521,099, Cl. 355-8.000.

Nagasaki, Sakon: *See—*
Kageyama, Yoshikazu; Nagasaki, Sakon; and Mino, Mineo, 4,521,735, Cl. 324-433.000.

Nagata, Hiromitsu, to Daiwa Seiko Inc. Fishing reel. 4,520,971, Cl. 242-220.000.

Nahara, Akira: *See—*
Arai, Yoshihiro; and Nahara, Akira, 4,521,482, Cl. 428-336.000.
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Naik, Ishverlal K.; and Eguchi, Ronald G., to Northrop Corporation. Integrated optical waveguide fabrication by ion implantation. 4,521,443, Cl. 427-38.000.

Naito, Motohiro, to Jeol Ltd. Mass spectrometer. 4,521,687, Cl. 250-296.000.

Nakagawa, Shinichi; and Ihara, Kiyohiko, to Daikin Kogyo Co., Ltd. Tetrafluoroethylene-ethylene type copolymer. 4,521,575, Cl. 526-206.000.

Nakagawa, Toshiaki, to Yoshida Kogyo K. K. Apparatus for holding a slide fastener slider. 4,520,560, Cl. 29-708.000.

Nakahama, Ryoji, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Tilt locking system for ship propellers. 4,521,202, Cl. 440-61.000.

Nakajima, Hiromichi: *See—*
Oh-ishi, Tokuro; Takeda, Mikio; Nakajima, Hiromichi; and Nagao, Taku, 4,521,430, Cl. 514-211.000.

Nakajima, Kichio; Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; and Honma, Kazuo, to Hitachi Construction Machinery Co., Ltd. Hydraulic drive system for single rod cylinder. 4,520,626, Cl. 60-468.000.

Nakajima, Tadakatsu; Nakayama, Wataru; and Daikoku, Takahiro, to Hitachi, Ltd. Falling film evaporation type heat exchanger. 4,520,866, Cl. 165-115.000.

Nakamoto, Hiromasa; Ogawa, Michitaka; Kobayashi, Muneo; Nogami, Yuki; Kumamoto, Kazuo; Murakami, Hiroko; Ninagawa, Yoichi; Omura, Yoshiaki; and Mizuno, Masao, to Nihon Iyakuhin Kogyo Co., Ltd.; and Kuraray Co., Ltd. Geranylgeranylacetamide compounds having a piperazine ring, salts thereof, pharmaceutical compositions containing said compounds, and method of treating ulcers in mammals. 4,521,417, Cl. 514-255.000.

Nakamura, Haruo, to Yamaha Hatsudoki Kabushiki Kaisha. Intake system for multiple valve type engine. 4,520,775, Cl. 123-308.000.

Nakamura, Koki: *See—*
Sugimoto, Tadao; Ikeda, Hideo; Mifune, Hiroyuki; and Nakamura, Koki, 4,521,508, Cl. 430-567.000.

Nakamura, Masao: *See—*
Oyama, Kiyotaka; Irino, Shigeaki; Harada, Tsuneo; and Nakamura, Masao, 4,521,514, Cl. 435-70.000.

Nakamura, Minoru: *See—*
Yamamoto, Yoshihiro; Suzuki, Junichiro; and Nakamura, Minoru, 4,521,248, Cl. 75-238.000.

Nakamura, Yukinobu; Tagami, Katsutoshi; and Takahashi, Tsuneo, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for visually indicating the current location of an automotive vehicle. 4,521,777, Cl. 340-995.000.

Nakanishi, Kiyoshi: *See—*
Matsushita, Souichi; Nakanishi, Kiyoshi; and Inoue, Tokuta, 4,520,783, Cl. 123-492.000.

Nakano, Takuo: *See—*
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,521,415, Cl. 514-252.000.

Nakano, Tatsuo: *See—*
Asai, Shinichiro; Katoh, Kazuo; and Nakano, Tatsuo, 4,521,476, Cl. 428-209.000.

Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, to Nissan Motor Co., Ltd. Method and system for determining weld quality in resistance welding. 4,521,665, Cl. 219-117.100.

Nakaya, Keiichi; and Sato, Kunio, to Asahi Glass Company, Ltd. Process for producing calcium hypochlorite hydrate crystals. 4,521,397, Cl. 423-474.000.

Nakayama, Kazuaki, to Pioneer Electronic Corporation. Bias current compensated amplifier. 4,521,740, Cl. 330-267.000.

Nakayama, Shozo; and Ogino, Sekiya, to Kabushiki Kaisha Morita Seisakusho. Air bearing device in dental handpiece. 4,521,190, Cl. 433-132.000.

Nakayama, Wataru: *See—*
Nakajima, Tadakatsu; Nakayama, Wataru; and Daikoku, Takahiro, 4,520,866, Cl. 165-115.000.

Nalco Chemical Company: *See—*
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Namiki Precision Jewel Co., Ltd.: *See—*
Shimamoto, Hiroshi, 4,521,877, Cl. 369-173.000.

Nandlal, Samlal, to Shell Offshore Inc. Lightweight semi-flexible dike. 4,521,131, Cl. 405-116.000.

Nanjo, Hirotoshi; Satou, Hiroo; and Takahashi, Osamu, to Kokusan Denki Co., Ltd. Method of controlling engine speed for internal combustion engine. 4,520,778, Cl. 123-352.000.

Nanometrics Incorporated: *See—*
Coates, Vincent J.; Grund, J. Evan; and Westrate, Stephen B., 4,521,686, Cl. 250-237.00R.

Napolitano, Pellegrino E., to Hudson Engineering Company. Self-priming pump system having diaphragm-type flow sensor. 4,521,156, Cl. 415-11.000.

Narula, Karam V.: *See—*
Gueldenpfennig, Klaus; Russell, Stanley L.; Oswald, William A.; Breidenstein, Charles J.; and Narula, Karam V., 4,521,879, Cl. 370-62.000.

Nash Engineering Company, The: *See—*
Olsen, Ole B.; Bilik, Charles W.; Johnson, Herbert H.; and Jozepaitis, Charles M., 4,521,161, Cl. 417-68.000.

Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., to Energy Conversion Devices, Inc. Process gas introduction, confinement and evacuation system for glow discharge deposition apparatus. 4,520,757, Cl. 118-723.000.

National Keystone Products Co.: *See—*
Metzler, Steven, 4,521,188, Cl. 433-74.000.

National Research Development Corporation: *See—*
Lockhart, Gordon B., 4,521,749, Cl. 332-17.000.

Natori, Yohei: *See—*
Otake, Noboru; Seto, Haruo; Sasaki, Tetsuo; Sugita, Masanori; Natori, Yohei; and Sueda, Noriyoshi, 4,521,339, Cl. 260-239.30B.

Nave, Jerald L.: *See—*
White, Daniel S.; and Nave, Jerald L., 4,520,811, Cl. 128-203.110.

NCR Corporation: *See—*
Granzow, Robert H.; Gupta, Desh B.; Myers, Kimbrough I.; and Filliman, Mark D., 4,521,008, Cl. 271-3.000.

Neese, Hans-Joachim: *See—*
Gevatter, Hans-Jurgen; Muller, Bernhard; and Neese, Hans-Joachim, 4,521,257, Cl. 148-11.50Q.

Neissel, John P.: *See—*
Terhune, James H.; and Neissel, John P., 4,521,373, Cl. 376-258.000.

Nelissen, Johan W. A.: *See—*
Ponjee, Johannes J.; Nelissen, Johan W. A.; and Verwijlen, Christiaan J. A., 4,521,444, Cl. 427-41.000.

Nelson, Gunnar I. Watertight electrical receptacle. 4,521,649, Cl. 200-50.00B.

Nelson, Joseph A. Nonmechanical digital raingauge. 4,520,667, Cl. 73-171.000.

Nelson, Ralph E., to Winfield Corp. Container for sharps. 4,520,926, Cl. 206-366.000.

Nelson, Richard C. Process for coating material with water resistant composition. 4,521,458, Cl. 427-294.000.

Nemet, Mihaly, to Budapesti Radiotechnikai Gyar. Ground-plane antenna with impedance matching. 4,521,784, Cl. 343-846.000.

Nemoto, Shigeru: *See—*
Kobayashi, Minoru; and Nemoto, Shigeru, 4,521,821, Cl. 360-137.000.

Neoff, Rutger: *See—*
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Neshem-Peterson, Inc.: *See—*
Sagness, Ronald L.; and Peterson, Donald A., 4,520,790, Cl. 126-109.000.

Nestec, S. A.: *See—*
Launay, Noel, 4,520,705, Cl. 83-879.000.

Nestec, S.A.: *See—*
Bengtsson, Bengt L.; Palmlin, Peter; and Saldert, Bertil K., 4,521,439, Cl. 426-509.000.

Nestor, Charles R.; Plyler, Robert G.; and Cross, William E., to General Motors Corporation. Socket connector for parallel circuit boards. 4,521,065, Cl. 339-75.0MP.

Netlon Limited: *See—*
Mercer, Frank B.; and Martin, Keith F., 4,521,368, Cl. 264-514.000.

Neubauer, Gerald: *See—*
Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Ohlinger, Manfred; Wilfinger, Hans J.; Pfannebecker, Emil; and Duffner, Paul, 4,521,527, Cl. 502-184.000.

Neulinger, Franz: *See—*
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Neumann, Klaus: *See*—
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New York University: *See*—
Lehneis, Hans R.; and Wilson, Robert G., 4,520,512, Cl. 3-22.000.
Newton, Donald O.: *See*—
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Neyer, Leo E.: *See*—
Simpson, Harold G.; and Neyer, Leo E., 4,520,610, Cl. 52-745.000.
Nezot, Francois: *See*—
Martel, Jacques; Buendia, Jean; and Nezot, Francois, 4,521,331, Cl. 252-522.00R.
NGK Spark Plug Co., Ltd.: *See*—
Yamamoto, Yoshihiro; Suzuki, Junichiro; and Nakamura, Minoru, 4,521,248, Cl. 75-238.000.
Nickel, Horst: *See*—
Beck, Ulrich; Stohr, Frank-Michael; and Nickel, Horst, 4,521,217, Cl. 8-639.000.
Nickerson, William F.: *See*—
Bryans, Lawrence G.; Goudey, Kenneth R.; and Nickerson, William F., 4,521,783, Cl. 343-781.00R.
Nielsen, Jens O. Reclosable plastic container. 4,520,943, Cl. 220-281.000.
Niemela, Tapio. Ski trails rotary cutter and crusher drag unit. 4,520,582, Cl. 37-222.000.
Niermann, Hermann: *See*—
Reichert, Gunter; Mainzer, Franz; Lehmann, Kurt; and Niermann, Hermann, 4,520,631, Cl. 62-188.000.
Niese, Leo J.; and Sharlow, Gary R., to Reliance Electric Company. Drum positioning system. 4,520,853, Cl. 141-168.000.
Nietupski, Ronald S. Appetite suppressant and method of application thereof. 4,521,427, Cl. 514-354.000.
Nifco Inc.: *See*—
Tanaka, Toshie, 4,521,148, Cl. 411-182.000.
Nigborowicz, John J.; and Friedline, Karl L., to RCA Corporation. Video source selector. 4,521,810, Cl. 358-181.000.
Nihon Iyakuhin Kogyo Co., Ltd.: *See*—
Nakamoto, Hiromasa; Ogawa, Michitaka; Kobayashi, Muneo; Nogami, Yuki; Kumamoto, Kazuo; Murakami, Hiroko; Ninagawa, Yoichi; Omura, Yoshiaki; and Mizuno, Masao, 4,521,417, Cl. 514-255.000.
Niino, Shuheu; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Control device for continuous rolling machine. 4,520,642, Cl. 72-8.000.
Ninagawa, Yoichi: *See*—
Nakamoto, Hiromasa; Ogawa, Michitaka; Kobayashi, Muneo; Nogami, Yuki; Kumamoto, Kazuo; Murakami, Hiroko; Ninagawa, Yoichi; Omura, Yoshiaki; and Mizuno, Masao, 4,521,417, Cl. 514-255.000.
Ninomiya, Yoshinobu; Somezawa, Masashi; and Hashimoto, Akira, to Sony Corporation. Magnetic recording medium. 4,521,486, Cl. 428-407.000.
Nintendo Co., Ltd.: *See*—
Uemura, Masayuki; Murauchi, Akitsugu; and Izushi, Takehiro, 4,521,020, Cl. 273-85.00G.
Nippon Electric Co., Ltd.: *See*—
Matsuda, Yoshihiro; Kimishima, Hiroshi; and Kado, Yoshikazu, 4,520,932, Cl. 209-545.000.
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Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Wachi, Masatada, 4,520,708, Cl. 84-1.260.
Nippon Kinzoku Co., Ltd.: *See*—
Sano, Yasumasa; and Ohwada, Tetsuya, 4,520,538, Cl. 24-682.000.
Nippon Light Metal Co., Ltd.: *See*—
Miki, Isao; and Kawai, Toshiyuki, 4,520,541, Cl. 29-156.8CF.
Nippon Notion Kogyo Co., Ltd.: *See*—
Kasai, Kazumi, 4,520,533, Cl. 24-198.000.
Nippon Oil Co., Ltd.: *See*—
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,521,294, Cl. 208-23.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Ohtsuka, Yasuji; Koike, Yasuhiro; and Yoshida, Motoaki, 4,521,351, Cl. 264-1.500.
Nippon Steel Corporation: *See*—
Tamehiro, Hiroshi: Mazuda, Hiroo; Ohashi, Mamoru; and Onoe, Yasumitsu, 4,521,258, Cl. 148-12.00F.
Nippon Telegraph & Telephone Public Corporation: *See*—
Ikeda, Masahiro, 4,521,069, Cl. 350-96.130.
Murakami, Toshiaki; Enomoto, Yoichi; and Inamura, Takahiro, 4,521,682, Cl. 250-211.00J.
Murase, Katsumi; and Mizushima, Yoshihiko, 4,521,794, Cl. 357-2.000.
Nisato, Dino; Frigerio, Marco; and Miranda, Giovanna F., to Sanofi. Anorexigenic trifluoromethylphenyltetrahydropyridines and pharmaceutical compositions containing them. 4,521,428, Cl. 514-277.000.
Nishida, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Ignition control system of internal combustion engine. 4,520,781, Cl. 123-414.000.
Nishida, Takashi: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Hosogai, Takeo; and Nishida, Takashi, 4,521,242, Cl. 71-94.000.
Nishiguchi, Akira: *See*—
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Nishihara, Toshio: *See*—
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Nishikawa, Kohei: *See*—
Oka, Yoshikazu; Nishikawa, Kohei; and Miyake, Akio, 4,521,607, Cl. 549-39.000.
Nishimura, Akira: *See*—
Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, 4,521,665, Cl. 219-117.100.
Nishimura, Yasuyuki; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Kuwahara, Takanori; and Tanimoto, Hirotoshi, to Babcock-Hitachi Kabushiki Kaisha. Process for producing acetaldehyde. 4,521,631, Cl. 568-478.000.
Nishina, Takashi: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,521,415, Cl. 514-252.000.
Nishino, Takaichi, to Tachikawa Spring Co., Ltd. Slide adjustment apparatus. 4,520,982, Cl. 248-430.000.
Nishiyama, Tadashi: *See*—
Kawamura, Yasuo; Nishiyama, Tadashi; Itoh, Tomiyoshi; and Sakai, Takuo, 4,521,406, Cl. 424-94.000.
Nishizono, Taira: *See*—
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Nissan Chemical Industries, Ltd.: *See*—
Obitsu, Masamichi; Hori, Takahiro; Koinuma, Toyoji; and Sakaguchi, Yuriko, 4,521,249, Cl. 106-12.000.
Nissan Motor Co., Ltd.: *See*—
Hatori, Yukiyoshi; Yagi, Eiji; and Kobari, Yuji, 4,520,777, Cl. 123-339.000.
Hayashi, Yoshimasa, 4,520,771, Cl. 123-195.00H.
Midorikawa, Minoru, 4,520,787, Cl. 123-556.000.
Nakata, Shuji; Kawaguchi, Yoshio; and Nishimura, Akira, 4,521,665, Cl. 219-117.100.
Ogawa, Naoki, 4,520,770, Cl. 123-195.00H.
Ozawa, Masuo; and Hirota, Toshio, 4,520,764, Cl. 123-3.000.
Shimonosono, Hitoshi; Ogawa, Naoki; and Hirano, Yoshinori, 4,520,768, Cl. 123-41.440.
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Nisshin Flour Milling Co., Ltd.: *See*—
Otake, Noboru; Seto, Haruo; Sasaki, Tetsuo; Sugita, Masanori; Natori, Yohei; and Sueda, Noriyoshi, 4,521,339, Cl. 260-239.30B.
Nitanda, Hiroshi: *See*—
Katayama, Hajime; Nitanda, Hiroshi; Nagaoka, Tateki; Kishi, Hirotoshi; Takada, Yusaku; Iida, Noriyoshi; Inuzuka, Tsuneki; and Komiya, Yutaka, 4,521,099, Cl. 355-8.000.
Niu, Tyan-Faung: *See*—
Russell, Philip P.; Niu, Tyan-Faung; and Holland, Frederic A., 4,521,457, Cl. 427-286.000.
NJM, Inc.: *See*—
Voltmer, Helmut; Schwenzer, Alfred F.; and Spano, John D., 4,521,271, Cl. 156-568.000.
Noack, Juergen: *See*—
Kretschmer, Horst; Tietze, Guenter; Noack, Juergen; Schweigel, Hans-Joachim; Schingnitz, Manfred; Werner, Klaus; and Kirsch, Bernd, 4,521,139, Cl. 406-19.000.
Noble Automated Systems, Inc.: *See*—
Ray, Joe R., 4,520,918, Cl. 198-640.000.
Ray, Joe R., 4,520,920, Cl. 198-761.000.
Noble, Robert T., to Texas Instruments Incorporated. Method of operating a stacked display. 4,521,775, Cl. 340-784.000.
Nogami, Yuki: *See*—
Nakamoto, Hiromasa; Ogawa, Michitaka; Kobayashi, Muneo; Nogami, Yuki; Kumamoto, Kazuo; Murakami, Hiroko; Ninagawa, Yoichi; Omura, Yoshiaki; and Mizuno, Masao, 4,521,417, Cl. 514-255.000.
Noguchi, Minetoshi: *See*—
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Nogueira, Eduardo D.: *See*—
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Nogueira, Gustavo D.; Vega, Jose M. R.; and Nogueira, Eduardo D. Procedure for obtaining high purity magnesium salts or their concentrate solutions from sea water, brine or impure magnesium salt solutions. 4,521,386, Cl. 423-157.000.
Nolte, Wilfried: *See*—
Musch, Rudiger; Gobel, Wilhelm; Konter, Wolfgang; and Nolte, Wilfried, 4,521,576, Cl. 526-213.000.
Nongbri, Govanon: *See*—
Chervenak, Michael C.; Eccles, Richard M.; and Nongbri, Govanon, 4,521,295, Cl. 208-59.000.
Noonan, David, Jr. Foot pattern device. 4,521,171, Cl. 425-2.000.
Norbisrath, Max: *See*—
Grebe, Reiner; Norbisrath, Max; and Schmidt, Karl-Heinz, 4,520,963, Cl. 241-30.000.
Noritsu Kenkyu Center Co., Ltd.: *See*—
Mukae, Toshiyuki; and Azuma, Yoshifumi, 4,521,105, Cl. 355-64.000.
Norota, Susumi; Kiriyama, Tsutomu; Imoto, Tadashi; and Azumi, Toshinori, to Teijin Limited. Filament-like fibers and bundles thereof,

and novel process and apparatus for production thereof. 4,521,364, Cl. 264-176.00F.
North American Philips Corporation: *See—*
Bingham, Joseph P.; and Hatch, Douglas J., 4,521,809, Cl. 358-120.000.
North American Utility Construction Corporation: *See—*
Stark, Virgil; and Genequand, Pierre, 4,520,794, Cl. 126-438.000.
Northern Telecom Limited: *See—*
Dupuis, Claude R.; and Hinz, Lorne C., 4,521,643, Cl. 179-2.0DP.
Northrop Corporation: *See—*
Blackhurst, William R., 4,520,975, Cl. 244-137.00R.
Naik, Ishverlal K.; and Eguchi, Ronald G., 4,521,443, Cl. 427-38.000.
Nowell, John R.: *See—*
Genuit, Luther L.; and Nowell, John R., 4,521,692, Cl. 290-4.00A.
Nozu, Taketo: *See—*
Kimura, Yoshiaki; Nozu, Taketo; and Tanaka, Yasuhiko, 4,521,788, Cl. 346-140.00R.
NSK-Warner K.K.: *See—*
Sano, Yasumasa; and Ohwada, Tetsuya, 4,520,538, Cl. 24-682.000.
Nuclear Monitoring Systems & Management Corporation: *See—*
Price, William E.; Galloway, Louie A., III; Lowrey, Charles B.; and Lewis, Donald R., 4,521,372, Cl. 376-250.000.
Nunzio, Godoli: *See—*
Gianezio, Paribelli; and Nunzio, Godoli, 4,520,511, Cl. 3-1.913.
Nutting, H. Eugene: *See—*
Isakson, John E.; and Nutting, H. Eugene, 4,521,132, Cl. 405-166.000.
N.V. Raychem S. A.: *See—*
Overbergh, Noel M. M.; Doucet, Jos; and Vansant, Jan, 4,521,470, Cl. 428-36.000.
Nygren, Bertil: *See—*
Bjorklund, Robert; Gustavsson, Hans; Lundstrom, Ingemar; and Nygren, Bertil, 4,521,450, Cl. 427-121.000.
O.T. Pumpen GmbH & Co. KG: *See—*
Stahlkopf, Friedrich R. R., 4,521,163, Cl. 417-238.000.
Oakdale, Warren R.: *See—*
Windawi, Hassan; Grieger, Gene R.; and Oakdale, Warren R., 4,521,394, Cl. 423-363.000.
Obara, Haruki: *See—*
Kinoshita, Mitsuo; and Obara, Haruki, 4,521,662, Cl. 219-69.00W.
Obenschain, Stephen P.; and Lehmberg, Robert H. Controllable spatial incoherence echelon for laser. 4,521,075, Cl. 350-162.110.
Ober, Stephen H.: *See—*
Wright, Thomas C.; and Ober, Stephen H., 4,520,827, Cl. 128-423.00W.
Obitsu, Masamichi; Hori, Takahiro; Koinuma, Toyoji; and Sakaguchi, Yuriko, to Nissan Chemical Industries, Ltd. Silicate containing agent and cement surface modified with said agent. 4,521,249, Cl. 106-12.000.
Occidental Chemical Agricultural Products, Inc.: *See—*
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., 4,521,392, Cl. 423-317.000.
Occidental Chemical Corporation: *See—*
Fifolt, Michael J.; and Foster, Arthur M., 4,521,616, Cl. 562-456.000.
O'Connor, James M.; and Lickei, Donald L., to Olin Corporation. Graft copolymers from vinyl monomers and polyurethane oligomers and polyurethanes prepared therefrom. 4,521,546, Cl. 521-137.000.
Octel Communications, Inc.: *See—*
Olson, Peter D.; and Hawes, Samuel R., Jr., 4,521,647, Cl. 179-84.0VF.
Oda, Eiji, to Nippon Electric Co., Ltd. Semiconductor imaging device using charge-coupling device. 4,521,797, Cl. 357-24.000.
Odebrecht, Wolfgang: *See—*
Andres, Rudolf; Grantz, Helmut; Munzel, Wolf-Dietrich; and Odebrecht, Wolfgang, 4,520,863, Cl. 165-48.00R.
Odobasic, Steven L. Torsion link. 4,521,003, Cl. 267-57.10A.
Ogawa, Hiroyasu; Izumi, Kazuo; and Shimazaki, Kenji, to Toho Beslon Co., Ltd. Activated carbon fiber spun yarn. 4,520,623, Cl. 57-236.000.
Ogawa, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Vane pump with intermediate rotary casing and drive clutch. 4,521,169, Cl. 418-69.000.
Ogawa, Hitoshi: *See—*
Kiyota, Yuhiko; Tsuji, Katsuyuki; Kume, Satoru; Takada, Hiroaki; Shinsei, Kiyoichi; Matsumoto, Akio; and Ogawa, Hitoshi, 4,520,624, Cl. 60-286.000.
Ogawa, Michitaka: *See—*
Nakamoto, Hiromasa; Ogawa, Michitaka; Kobayashi, Muneo; Nogami, Yuki; Kumamoto, Kazuo; Murakami, Hiroko; Ninagawa, Yoichi; Omura, Yoshiaki; and Mizuno, Masao, 4,521,417, Cl. 514-255.000.
Ogawa, Naoki, to Nissan Motor Co., Ltd. Automotive internal combustion engine with bearing beam structure. 4,520,770, Cl. 123-195.00H.
Ogawa, Naoki: *See—*
Shimonosono, Hitoshi; Ogawa, Naoki; and Hirano, Yoshinori, 4,520,768, Cl. 123-41.440.
Ogawa, Yoh: *See—*
Inaba, Humio; Ito, Hiromasa; and Ogawa, Yoh, 4,521,681, Cl. 250-205.000.
Ogino, Sekiya: *See—*
Nakayama, Shozo; and Ogino, Sekiya, 4,521,190, Cl. 433-132.000.
Ogino, Takao; Watanabe, Yoichi; and Sano, Shigehisa, to Bridgestone Tire Company Limited. High-durable pneumatic radial tires. 4,520,857, Cl. 152-527.000.
Ogland, Jon W., to United States of America, Air Force. High voltage grounding device for pressurized equipment. 4,521,656, Cl. 200-148.00B.
Oh-ishi, Tokuro; Takeda, Mikio; Nakajima, Hiromichi; and Nagao, Taku, to Tanabe Seiyaku Co., Ltd. 1,5-Benzothiazepin-4-one, their pharmaceutical compositoins, and methods of use. 4,521,430, Cl. 514-211.000.
Ohashi, Hajime: *See—*
Kanematsu, Hiroyuki; Nagae, Akimitsu; Mizoguchi, Kiyohisa; and Ohashi, Hajime, 4,521,860, Cl. 364-474.000.
Ohashi, Mamoru: *See—*
Tamehiro, Hiroshi; Mazuda, Hiroo; Ohashi, Mamoru; and Onoe, Yasumitsu, 4,521,258, Cl. 148-12.00F.
Ohata, Yousuke: *See—*
Motomura, Minoru; Shibata, Kiyoshi; Watanabe, Toshio; and Ohata, Yousuke, 4,521,102, Cl. 355-14.0CU.
Ohba, Koichi: *See—*
Niino, Shuheu; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, 4,520,642, Cl. 72-8.000.
Ohi Seisakusho Co., Ltd.: *See—*
Kagiyama, Tsutomu; and Takaishi, Tatsuyuki, 4,520,914, Cl. 192-71.000.
Ohira, Seiichi: *See—*
Sasaki, Tohru; Endoh, Hiroyuki; and Ohira, Seiichi, 4,521,483, Cl. 428-373.000.
Ohlinger, Manfred: *See—*
Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Ohlinger, Manfred; Wilfinger, Hans J.; Pfannebecker, Emil; and Duffner, Paul, 4,521,527, Cl. 502-184.000.
Ohshima, Nobumasa: *See—*
Tamai, Takashi; Tomiyama, Shigefumi; and Ohshima, Nobumasa, 4,520,661, Cl. 73-129.000.
Ohta, Wataru: *See—*
Suzuki, Shoichi; Ohta, Wataru; Sakurai, Noriaki; and Yamashita, Michio, 4,521,133, Cl. 405-195.000.
Ohtsuka, Shuichi; Aotsuka, Yasuo; and Saito, Eiichi, to Fuji Photo Film Co., Ltd. Electrophotographic reversal developing apparatus with control of developing electrode bias potential. 4,521,103, Cl. 355-14.00D.
Ohtsuka, Yasuji; Koike, Yasuhiro; and Yoshida, Motoaki, to Nippon Sheet Glass Co., Ltd. Process for producing light-transmitting element of synthetic resin. 4,521,351, Cl. 264-1.500.
Ohwada, Tetsuya: *See—*
Sano, Yasumasa; and Ohwada, Tetsuya, 4,520,538, Cl. 24-682.000.
Oishibashi, Hirotsugu: *See—*
Hayashi, Mitsuji; Endo, Hideo; Oishibashi, Hirotsugu; Aichi, Takeo; and Sasaki, Shigeru, 4,520,756, Cl. 118-699.000.
Oizumi, Masayuki; Abe, Masaharu; and Fushiki, Yasuo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Flame-retarded copper-clad laminate. 4,521,491, Cl. 428-458.000.
Oka, Takashi, to Sharp Kabushiki Kaisha. Sheet file mounting-/demounting mechanism in an item selection signal input system. 4,520,583, Cl. 40-378.000.
Oka, Yoshikazu; Nishikawa, Kohei; and Miyake, Akio, to Takeda Chemical Industries, Ltd. Chromanyl glycines. 4,521,607, Cl. 549-39.000.
Okado, Hiroyuki; Masuda, Shigeru; and Mori, Teijiro, to Mitsubishi Denki Kabushiki Kaisha. Electric power switch with slotted commutation end plate. 4,521,655, Cl. 200-147.00R.
Okamoto, Ken: *See—*
Niino, Shuheu; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, 4,520,642, Cl. 72-8.000.
Okamoto, Takeshi; and Minagawa, Shoichi, to Clarion Co., Ltd. Unidirectional transducer for a surface-acoustic-wave device and a method of making same. 4,521,711, Cl. 310-313.00B.
Okazaki, Hideo; Imagome, Hiroshi; Suzuka, Susumu; and Sakai, Kiyoshi, to Hodogaya Chemical Co., Ltd.; and Ricoh Company, Ltd. Carbazole compounds and process for preparing the same. 4,521,605, Cl. 548-440.000.
Okino, Seiki: *See—*
Kandachi, Takayoshi; Okino, Seiki; Yanai, Toshiharu; and Tanaka, Katsuto, 4,521,454, Cl. 427-168.000.
Okitsu, Kiyoshi: *See—*
Watanabe, Shoji; Inoue, Kimio; and Okitsu, Kiyoshi, 4,521,570, Cl. 525-415.000.
Olave, Solozabal y Cia., S.A.: *See—*
Urresti, Jose E. A., 4,520,956, Cl. 227-120.000.
Olin Corporation: *See—*
Boudakian, Max M., 4,521,603, Cl. 546-304.000.
Butt, Sheldon H.; Smith, Edward F., III; and Gyurina, F. Dennis, 4,521,469, Cl. 428-35.000.
Frentzel, Richard L., 4,521,615, Cl. 560-198.000.
Kadija, Igor V., 4,521,281, Cl. 204-25.000.
O'Connor, James M.; and Lickei, Donald L., 4,521,546, Cl. 521-137.000.
Sandel, Bonnie B., 4,521,325, Cl. 252-77.000.
Olsen, Everett O.: *See—*
Gilby, Anthony C.; Lewis, Edward L.; and Olsen, Everett O., 4,521,684, Cl. 250-227.000.
Olsen, Ole B.; Bilik, Charles W.; Johnson, Herbert H.; and Jozepaitis, Charles M., to Nash Engineering Company, The. Noise control for conically ported liquid ring pumps. 4,521,161, Cl. 417-68.000.
Olsen, Robert C.: *See—*
Edwards, Bryant; Klygis, M. Julius; and Olsen, Robert C., 4,520,924, Cl. 206-150.000.

Olshansky, Alexis; and Guild, Gerald A., to Beloit Corporation. Motor driven slitter of narrow configuration. 4,520,704, Cl. 83-499.000.
Olson, Peter D.; and Hawes, Samuel R., Jr., to Octel Communications, Inc. Tone detection system and method. 4,521,647, Cl. 179-84.0VF.
Olstowski, Franciszek; and Peffley, Richard D., to Dow Chemical Company, The. Non-aqueous urea-polyether gel compositions and a method for their preparation. 4,521,330, Cl. 252-51.50R.
Olympus Optical Co., Ltd.: *See—*
Horikawa, Yoshiaki, 4,521,108, Cl. 356-123.000.
Kobayashi, Minoru; and Nemoto, Shigeru, 4,521,821, Cl. 360-137.000.
Kurihara, Takashi, 4,521,084, Cl. 350-432.000.
Kurita, Hiroyuki, 4,521,086, Cl. 350-464.000.
Togino, Takayoshi, 4,521,083, Cl. 350-414.000.
Omata, Takashi: *See—*
Suzuki, Akiyoshi; Sato, Hirosi; Omata, Takashi; and Kosugi, Masao, 4,521,082, Cl. 350-405.000.
Omholt, Bruce D. Motorcycle. 4,520,891, Cl. 180-219.000.
OMI International Corporation: *See—*
Tremmel, Robert A., 4,521,282, Cl. 204-52.00R.
Omni Devices, Inc.: *See—*
Alton, Michael J., 4,521,771, Cl. 340-705.000.
Omura, Yoshiaki: *See—*
Nakamoto, Hiromasa; Ogawa, Michitaka; Kobayashi, Muneo; Nogami, Yuki; Kumamoto, Kazuo; Murakami, Hiroko; Ninagawa, Yoichi; Omura, Yoshiaki; and Mizuno, Masao, 4,521,417, Cl. 514-255.000.
O'Neal, Chester L. Disposable toothbrush with cap. 4,521,128, Cl. 401-183.000.
Ong, Poen S.; Zermeno, Alfonso; Marsh, Lee M., Jr.; Hevezi, James M.; and Cowart, Ronald W., to University of Texas System. Electrostatic imaging apparatus. 4,521,808, Cl. 358-111.000.
Ono, Yoshio; and Sakamoto, Seiya, to Dainippon Screen Mfg. Co., Ltd. Method and apparatus for simultaneously outputting a graphic signal and an alphanumeric signal by using an image reproducing system. 4,521,814, Cl. 358-296.000.
Onoe, Akira: *See—*
Kato, Taketoshi; and Onoe, Akira, 4,521,801, Cl. 357-71.000.
Onoe, Yasumitsu: *See—*
Tamehiro, Hiroshi; Mazuda, Hiroo; Ohashi, Mamoru; and Onoe, Yasumitsu, 4,521,258, Cl. 148-12.00F.
Ontario Research Foundation: *See—*
Brandstatter, Hans G., 4,521,385, Cl. 423-76.000.
Onzou, Michio: *See—*
Sato, Hideyori; Inaba, Nobuaki; Arai, Mitsuru; and Onzou, Michio, 4,520,625, Cl. 60-464.000.
Oouchi, Tomihisa; Usui, Sampei; Fukuda, Tamio; and Nishiguchi, Akira, to Hitachi, Ltd. Multi-stage absorption refrigeration system. 4,520,634, Cl. 62-476.000.
Orchard Machinery Corporation: *See—*
Brandt, Richard W., 4,521,468, Cl. 428-35.000.
Orgeron, Orey C. Fire escape apparatus for use in high-rise buildings and the like. 4,520,900, Cl. 182-238.000.
Oriental Metal Mfg. Co., Ltd.: *See—*
Tsumura, Kenji; and Yamashita, Masayuki, 4,521,276, Cl. 159-1.00W.
Orr, Allie E. Adjustable reflector for illuminating devices. 4,521,834, Cl. 362-139.000.
Orsic, Milo, to AT&T Bell Laboratories. Time-slot interchanger for fast circuit switching. 4,521,880, Cl. 370-68.000.
Orthner, Gordon W.: *See—*
Adsit, Gordon H., 4,521,116, Cl. 366-54.000.
Osborn, Norbert L. Turbocharger compressor housing. 4,521,155, Cl. 415-190.000.
Osgood Industries, Inc.: *See—*
Mueller, Martin, 4,521,264, Cl. 156-184.000.
Osial, Thaddeus A.; Bosna, Alexander A.; and Kulak, Richard J., to Westinghouse Electric Corp. Method of hermetically laser sealing electronic packages. 4,521,668, Cl. 219-121.0LC.
Osinski, Ulrich: *See—*
Althausen, Ferdinand; Proksa, Ferdinand; and Osinski, Ulrich, 4,520,947, Cl. 222-63.000.
Osterholt, Gerd: *See—*
Lorenz, Kurt; Bruns, Engelbert; and Osterholt, Gerd, 4,521,279, Cl. 202-227.000.
Ostermaier, John J., to Du Pont de Nemours, E. I., and Company. Recovery of arylboranes. 4,521,628, Cl. 568-1.000.
Osterreichische Schiffswerften Aktiengellschaft Linz-Korneuburg: *See—*
Anger, Anton, 4,521,178, Cl. 425-548.000.
Oswald, Charles W., to Caterpillar Tractor Co. Mounting apparatus for a control lever. 4,521,650, Cl. 200-61.880.
Oswald, William A.: *See—*
Gueldenpfennig, Klaus; Russell, Stanley L.; Oswald, William A.; Breidenstein, Charles J.; and Narula, Karam V., 4,521,879, Cl. 370-62.000.
Otake, Etsuo; Kimura, Mamoru; Yokota, Hiromu; and Kanematu, Tetuo, to Daicel Chemical Industries, Ltd. Low-melting glass paste and cellulose nitrate therefor. 4,521,251, Cl. 106-183.000.
Otake, Noboru; Seto, Haruo; Sasaki, Tetsuo; Sugita, Masanori; Natori, Yohei; and Sueda, Noriyoshi, to Nisshin Flour Milling Co., Ltd. Ansatrienols. 4,521,339, Cl. 260-239.30B.
Otis Elevator Company: *See—*
Rado, David J.; and Coste, Steven D., 4,520,904, Cl. 187-29.00R.
Otten, Heinrich, to Franz Kuhlmann Prazisionsmechanik und Maschinenbau GmbH & Co. KG. Guide rail for a drawing machine carriage. 4,520,573, Cl. 33-438.000.
Otto, Maurice J.; and Peridont, Jean-Pierre, to Societe Anonyme dite: Etudes et Fabrications Optiques. Grinding or polishing machine for optical lenses. 4,520,596, Cl. 51-55.000.
Ouchi, Hideyuki: *See—*
Yoshida, Takashi; Fujie, Masakatsu; Matsuno, Junichi; and Ouchi, Hideyuki, 4,521,813, Cl. 358-296.000.
Oury, Jean-Claude, to Societe anonyme dite: Prestinox S.A. Attachment for supplying a filler wire to an electric soldering iron of the pen type. 4,521,673, Cl. 219-230.000.
Ouwerkerk, Johannes H. W.; Lucieer, Wouter B.; and Cramer, Rudolph E., to Hoogovens Groep B.V. Arrangement for mixing a gas into a main flow of a second gas. 4,521,117, Cl. 366-165.000.
Overbergh, Noel M. M.; Doucet, Jos; and Vansant, Jan, to N.V. Raychem S. A. Dimensionally heat recoverable article. 4,521,470, Cl. 428-36.000.
Ovshinsky, Stanford R.; Hudgens, Stephen J.; and Kastner, Marc A., to Sovonics Solar Systems. Method and apparatus for making layered amorphous semiconductor alloys using microwave energy. 4,521,447, Cl. 427-45.100.
Owens-Corning Fiberglas Corporation: *See—*
Aubourg, Patrick F.; and Fabricant, Barbara L., 4,521,523, Cl. 501-30.000.
Owens, Ester L., to Eldridge, Gordon E., a part interest. Valve testing apparatus. 4,520,655, Cl. 73-46.000.
Oxide & Chemical Corporation: *See—*
McKinney, Benjamin F., 4,521,399, Cl. 423-620.000.
Oyama, Kiyotaka; Irino, Shigeaki; Harada, Tsuneo; and Nakamura, Masao, to Toyo Soda Manufacturing Co., Ltd.; Ajinomoto Co., Inc.; and Sagami Chemical Research Center. Process for producing an addition compound of a dipeptide ester and an amino acid ester. 4,521,514, Cl. 435-70.000.
Ozawa, Chiaki, to Bridgestone Tire Company Limited. Tire building apparatus. 4,521,269, Cl. 156-420.000.
Ozawa, Kunitaka: *See—*
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; Koumura, Noboru; and Kazuma, Koji, 4,521,805, Cl. 358-75.000.
Ozawa, Masuo; and Hirota, Toshio, to Nissan Motor Co., Ltd. Starter for an alcohol engine. 4,520,764, Cl. 123-3.000.
Pacific Atlantic Products, Ltd.: *See—*
Lummis, Michael G., 4,520,589, Cl. 43-43.120.
Pall Corporation: *See—*
Pall, David B., 4,521,309, Cl. 210-493.200.
Pall, David B., to Pall Corporation. Filter cartridge with castellated support and process of making the same. 4,521,309, Cl. 210-493.200.
Palmer, David A.; and Palmer, James K., to Montedoro-Whitney Corporation. Field-portable calibration unit for electromagnetic flow meters. 4,520,650, Cl. 73-3.000.
Palmer, James K.: *See—*
Palmer, David A.; and Palmer, James K., 4,520,650, Cl. 73-3.000.
Palmlin, Peter: *See—*
Bengtsson, Bengt L.; Palmlin, Peter; and Saldert, Bertil K., 4,521,439, Cl. 426-509.000.
Panchenko, Anatoly I.: *See—*
Yarygin, Vladimir I.; Sannikov, Jury I.; Panchenko, Anatoly I.; Sychev, Anatoly P.; Vikharev, Ivan G.; Kuur, Vyacheslav P.; and Toguzov, Mels Z., 4,521,245, Cl. 75-21.000.
Pannell, Reginald J. H.: *See—*
Gange, Lester; and Pannell, Reginald J. H., 4,520,754, Cl. 118-626.000.
Pannell, Reginald James Harding: *See—*
Gange, Lester; and Pannell, Reginald J. H., 4,520,754, Cl. 118-626.000.
Papenfuhs, Theodor; and Volk, Heinrich, to Hoechst Aktiengesellschaft. Process for preparing pure alkyl 1-hydroxy-2-naphthoates. 4,521,617, Cl. 562-467.000.
Paper Converting Machine Company: *See—*
DuFresne, Allen J., 4,521,209, Cl. 493-432.000.
Ecker, Harold; and Spencer, Harvey J., 4,520,728, Cl. 101-248.000.
Pardue, E. Forrest: *See—*
Canada, Ronald G.; Piety, Kenneth R.; Simpson, Daniel G.; and Pardue, E. Forrest, 4,520,674, Cl. 73-660.000.
Parker, Dane K.: *See—*
Patterson, Dennis B.; Parker, Dane K.; and Hess, Lloyd D., Jr., 4,521,574, Cl. 526-204.000.
Parkinson, Francis J., to British Nuclear Fuels plc. Pumping system. 4,521,162, Cl. 417-138.000.
Parkyn, William A.; Ladd, Horace W.; and Mellon, Andrew M. Solar collector having tank and glazing construction. 4,520,795, Cl. 126-443.000.
Parlman, Robert M.; and Bresson, Clarence R. Ore flotation with combined collectors. 4,521,300, Cl. 209-166.000.
Parsons, Natan E. Ultrasonic flow-control system. 4,520,516, Cl. 4-623.000.
Pascarella, Vincent J.: *See—*
Solomon, Donald D.; McGary, Charles W.; and Pascarella, Vincent J., 4,521,564, Cl. 525-54.100.
Pask, George, to Rolls-Royce Limited. Load distribution member. 4,521,159, Cl. 416-174.000.
Pasko, Walter J., Jr.; and Rathbun, William H., to General Electric Company. Methods for assembling a transformer core. 4,520,556, Cl. 29-606.000.

Passarotti, Carlo: *See*—
Doria, Gianfederico; Passarotti, Carlo; Lovisolo, Pier P.; and Buttinoni, Ada, 4,521,419, Cl. 514-267.000.
Pastor, Stephen D.: *See*—
Spivack, John D.; and Pastor, Stephen D., 4,521,320, Cl. 252-47.500.
Patel, Arvind D.: *See*—
Chen, Robert G.; Patel, Arvind D.; and Sample, Thomas E., Jr., 4,521,578, Cl. 526-288.000.
Patterson, Dennis B.; Parker, Dane K.; and Hess, Lloyd D., Jr., to Goodyear Tire & Rubber Company, The. Incorporation of functionalized monomers. 4,521,574, Cl. 526-204.000.
Paulson, Charles M., Jr.; and Faulhaber, Mark E., to Du Pont de Nemours, E. I., and Company. Apparatus for measurement of molecular orientation. 4,521,111, Cl. 356-367.000.
Paulus, Wilfried: *See*—
Schmitt, Hans-Georg; Reinecke, Paul; Paulus, Wilfried; Genth, Hermann; and Radt, Walter, 4,521,412, Cl. 514-244.000.
Paust, Joachim: *See*—
Fischer, Rolf; Weitz, Hans-Martin; and Paust, Joachim, 4,521,342, Cl. 260-410.000.
Pauzin, Alexis. Sheet-metal bending brake. 4,520,646, Cl. 72-313.000.
Pav, Josef; and Wenzel, Reinhard, to Kleinewefers GmbH. Pressure roll for use in calenders or the like. 4,520,723, Cl. 100-162.00B.
Pearson, Robert L.: *See*—
Hastings, Jerome K.; Bigelow, James H.; and Pearson, Robert L., 4,521,757, Cl. 335-79.000.
Peck, Daniel A.; and Callaghan, Vincent M., to Combustion Engineering, Inc. Vessel liquid level indication. 4,521,371, Cl. 376-245.000.
Pedjac, Joseph J., to Dow Chemical Company, The. Bromination process. 4,521,633, Cl. 568-639.000.
Peebles, William C., Jr.; and Bowers, Cecil W., to Flanders Filters,Inc. Housing for high efficiency particulate air filters. 4,521,234, Cl. 55-481.000.
Peffley, Richard D.: *See*—
Olstowski, Franciszek; and Peffley, Richard D., 4,521,330, Cl. 252-51.50R.
Pegg, David T.; Doddrell, David M.; and Bendall, Max R. Pulse sequence for use in performing nuclear magnetic resonance spectroscopy. 4,521,732, Cl. 324-300.000.
Pelham, Russell W.; Redden, Charlotte S.; Eshkol, Aliza; and Stiles, Gerald E., to Serono Pharmaceutical Partners. Treatment of acquired immune deficiency syndrome with thymus extract. 4,521,407, Cl. 424-95.000.
Pellegrino, Peter P. Method for mass producing printed circuit boards. 4,521,262, Cl. 156-150.000.
Penneck, Richard J., to Raychem Corporation. High voltage insulating materials. 4,521,549, Cl. 523-173.000.
Pennington, Edward M.: *See*—
Raupuk, Milton W., Jr.; and Pennington, Edward M., 4,520,513, Cl. 4-302.000.
Pennwalt Corporation: *See*—
Milora, David J., 4,521,332, Cl. 252-527.000.
Pentel Kabushiki Kaisha: *See*—
Sakaoka, Gouji; and Ishikawa, Takashi, 4,521,126, Cl. 401-65.000.
Peraud, Jean-Claude: *See*—
Fournier, Pascal; and Peraud, Jean-Claude, 4,520,859, Cl. 164-253.000.
Peridont, Jean-Pierre: *See*—
Otto, Maurice J.; and Peridont, Jean-Pierre, 4,520,596, Cl. 51-55.000.
Perilstein, Warren L., to Ethyl Corporation. Alcohol based fuels containing corrosion inhibitors. 4,521,219, Cl. 44-55.000.
Peroutky, Donald C.: *See*—
Case, Allen W., Jr.; and Peroutky, Donald C., 4,521,670, Cl. 219-130.010.
Perry, George J.: *See*—
Kuehnle, Manfred R.; Perry, George J.; and Rose, Robert M., 4,521,097, Cl. 355-3.00R.
Peters, Charles W. Resiliently flexible toothbrush. 4,520,526, Cl. 15-167.00R.
Peters, Leo. Hamburger-type meat patties. 4,521,435, Cl. 426-92.000.
Petersen, Thomas D. Collateral ligament retractor. 4,520,797, Cl. 128-20.000.
Peterson, Bruce W.: *See*—
Cuscurida, Michael; and Peterson, Bruce W., 4,521,572, Cl. 525-507.000.
Peterson, Donald A.: *See*—
Sagness, Ronald L.; and Peterson, Donald A., 4,520,790, Cl. 126-109.000.
Peterson Mfg. Co.: *See*—
Templeman, Arthur R., 4,520,983, Cl. 248-481.000.
Peterson, Richard L.; Scheurer, Roger J.; and Steinberg, Richard W., to Hiniker Company. Gauge and guide wheel assembly. 4,520,876, Cl. 172-427.000.
Peterson, William A., to AT&T Bell Laboratories. Low offset voltage transistor bridge transconductance amplifier. 4,521,739, Cl. 330-257.000.
Petit, Jean-Pierre; and Maitre, Xavier. Distributed arithmetic oversampling recursive digital filter. 4,521,866, Cl. 364-724.000.
Petras, Jeffrey L.: *See*—
Worley, Robert F.; and Petras, Jeffrey L., 4,520,609, Cl. 52-729.000.
Petrovic, Branko. Circuit arrangement for indicating the names of broadcasting stations in radio or TV receivers. 4,521,914, Cl. 455-158.000.
Pettit, John R.: *See*—
Slyker, Richard W.; and Pettit, John R., 4,521,040, Cl. 285-140.000.
Pettus, John A.: *See*—
Jenkins, Richard L.; Pettus, John A.; and Abner, David K., 4,521,225, Cl. 55-18.000.
Peugeot, Richard S., to Ridge, Inc. Microfocus X-ray system. 4,521,902, Cl. 378-138.000.
Pezzolo, Donald E.; Pfeiffer, James W.; and Corder, Thomas E., to Intermatic Incorporated. Programmable wall switch for controlling lighting times and loads. 4,521,843, Cl. 364-145.000.
Pfannebecker, Emil: *See*—
Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Ohlinger, Manfred; Wilfinger, Hans J.; Pfannebecker, Emil; and Duffner, Paul, 4,521,527, Cl. 502-184.000.
Pfeiffer, James W.: *See*—
Pezzolo, Donald E.; Pfeiffer, James W.; and Corder, Thomas E., 4,521,843, Cl. 364-145.000.
Pfizer Inc.: *See*—
Hamanaka, Ernest S.; and Stam, John G., 4,521,533, Cl. 514-80.000.
Pfriender, John A. Animal house. 4,520,758, Cl. 119-19.000.
Phaal, Cornelius. Tool component. 4,520,881, Cl. 175-329.000.
Phaneuf, Charles A., to United Technologies Corporation. Series switching regulator. 4,521,725, Cl. 323-282.000.
Phelps Dodge Magnet Wire Co.: *See*—
Hilker, G. Daniel; Lausen, Verne H.; Coon, Jessie H.; Bodette, James E.; Grimes, Jerry L.; Wright, Roger D.; Disque, Donny R.; and Bultemeier, Keith D., 4,521,173, Cl. 425-113.000.
Phelps, Weldon L.; and Stahl, Alan L., to Caterpillar Tractor Co. Multiple threshold wheel slip control apparatus and method. 4,521,856, Cl. 364-426.000.
Philips, Franciscus M.; and de Jong, Koenraad A. Combination of a hoistdrum and hoistcable for a winch. 4,520,999, Cl. 254-278.000.
Phillips, Kenneth G., to Nalco Chemical Company. Acrylamide synthesis from an oil-in-water emulsion containing acrylonitrile. 4,521,620, Cl. 564-128.000.
Phillips, William E. Inflatable air pump. 4,521,166, Cl. 417-478.000.
Photomeca S.A.: *See*—
Ferrante, Mario, 4,521,092, Cl. 354-320.000.
Physical Systems, Inc.: *See*—
Hutter, Charles G., III, 4,520,836, Cl. 137-59.000.
Piaggio & C. S.p.A.: *See*—
Doveri, Carlo, 4,521,208, Cl. 474-101.000.
Picazo, Jose J., Jr.: *See*—
Biba, Kenneth J.; and Picazo, Jose J., Jr., 4,521,891, Cl. 375-8.000.
Pickens, Stanley R., to PPG Industries, Inc. Electro organic method and apparatus for carrying out same. 4,521,283, Cl. 204-59.00R.
Picker International, Ltd.: *See*—
Burl, Michael; and Young, Ian R., 4,520,828, Cl. 128-653.000.
Pickering, William: *See*—
Melocik, Grant C.; and Pickering, William, 4,521,885, Cl. 371-29.000.
Pierantozzi, Ronald, to Air Products and Chemicals, Inc. Process for producing dimethyl ether form synthesis gas. 4,521,540, Cl. 518-717.000.
Pierquin, Jean-Claude, to Essilor International (Compagnie Generale d'Optique). Spectacle frame with removable face assembly. 4,521,090, Cl. 351-124.000.
Piety, Kenneth R.: *See*—
Canada, Ronald G.; Piety, Kenneth R.; Simpson, Daniel G.; and Pardue, E. Forrest, 4,520,674, Cl. 73-660.000.
Pigeon, Michel; and Saglio, Robert, to Commissariat a l'Energie Atomique. Device for positioning a member facing each of the perforations of a perforated plate in accordance with a given grid. 4,521,150, Cl. 414-749.000.
Pignolet, Louis: *See*—
Isaac, Olivier; and Pignolet, Louis, 4,520,845, Cl. 137-624.270.
Pinson, George T., to Boeing Company, The. Target seeker used in a pointer and tracking assembly. 4,521,782, Cl. 343-765.000.
Pinto, Akiva. Fiber feeding apparatus with a pivoted air exhaust wall portion. 4,520,530, Cl. 19-105.000.
Pioneer Electronic Corporation: *See*—
Nakayama, Kazuaki, 4,521,740, Cl. 330-267.000.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, to International Flavors & Fragrances Inc. 4(Hydrocarbylthio)acetoacetic esters. 4,521,613, Cl. 560-152.000.
Place, George H., Jr.: *See*—
Ziehm, Richard T.; Wilczek, Stephen P.; Baker, George E.; Husted, Raymond R.; Dumas, Glen A.; Bunker, Keith G.; and Place, George H., Jr., 4,521,847, Cl. 364-184.000.
Plas, Jean J. R.: *See*—
Puttemanns, Louis; and Plas, Jean J. R., 4,521,836, Cl. 362-145.000.
Plath, Peter; Rohr, Wolfgang; Schwendemann, Volker; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Heterocyclic dihaloacetamides, and herbicides which contain acetanilides as herbicidal active ingredients and the dihaloacetamides as antagonistic agents. 4,521,604, Cl. 548-301.000.
Plavac, Frank, to Chevron Research Company. Poly(oxyalkylene) aminoether carbamates as deposit control additives. 4,521,610, Cl. 560-27.000.
Plyler, Robert G.: *See*—
Nestor, Charles R.; Plyler, Robert G.; and Cross, William E., 4,521,065, Cl. 339-75.0MP.
Pocius, Alphonsus V.; and Schultz, William J., to Minnesota Mining and Manufacturing Co. Two-part epoxy composition. 4,521,490, Cl. 428-416.000.

Podszun, Wolfgang; Simm, Walter; Goossens, John; and Suling, Carlhans, to Agfa-Gevaert Aktiengesellschaft. Electrostatographic suspension developer and process for the production thereof. 4,521,505, Cl. 430-112.000.

Pohl, Wolfgang D.: *See*—
Bednorz, Johannes G.; Hollis, Ralph L., Jr.; Lanz, Martin; Pohl, Wolfgang D.; and Yeack-Scranton, Celia E., 4,520,570, Cl. 33-180.00R.

Pohlenz, Jack B.: *See*—
Samish, Norman C.; and Pohlenz, Jack B., 4,521,388, Cl. 423-235.000.

Polaroid Corporation: *See*—
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,521,588, Cl. 528-363.000.

Poler, Stanley. Method of making a lens and haptic assembly. 4,521,273, Cl. 156-630.000.

Polybottle: *See*—
Lyons, Gerard E., 4,520,936, Cl. 215-1.00C.

Pomeroy, Gary G. Portable exercise device. 4,521,009, Cl. 272-73.000.

Pommer, Ernst-Heinrich: *See*—
Meyer, Norbert; Zeeh, Bernd; Buschmann, Ernst; and Pommer, Ernst-Heinrich, 4,521,429, Cl. 514-383.000.

Pommier, Alain Gaston, heir: *See*—
Pommier, Jean, deceased, 4,520,856, Cl. 152-454.000.

Pommier, Jean, deceased (by Pommier, Alain Gaston, heir), to Compagnie Generale des Etablissements Michelin. Radial tire for heavy loads. 4,520,856, Cl. 152-454.000.

Ponghis, Nikolas G.; and Poos, Arthur G., to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Operating a blast furnace with the injection of hot reducing gases. 4,521,246, Cl. 75-42.000.

Ponjee, Johannes J.; Nelissen, Johan W. A.; and Verwijlen, Christiaan J. A., to U.S. Philips Corporation. Method of providing a metal layer on a substrate. 4,521,444, Cl. 427-41.000.

Pont-A-Mousson, S.A.: *See*—
Fournier, Pascal; and Peraud, Jean-Claude, 4,520,859, Cl. 164-253.000.

Poos, Arthur G.: *See*—
Ponghis, Nikolas G.; and Poos, Arthur G., 4,521,246, Cl. 75-42.000.

Pope, David W.: *See*—
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Poradish, Frank J.: *See*—
Logan, Russell H.; and Poradish, Frank J., 4,521,861, Cl. 364-517.000.

Porter, Michael R.; and Elliott, Ross W. Tube-welding auxiliary. 4,521,669, Cl. 219-125.110.

Portescap: *See*—
Claude, Oudet, 4,521,723, Cl. 318-696.000.

Portilla, Mario. Sewing machine with articulated table assembly. 4,520,744, Cl. 112-260.000.

Posalux S.A.: *See*—
Imhof, Werner, 4,520,551, Cl. 29-568.000.

Potiron, Andre: *See*—
Bonnot, Guy; Laviolette, Pierre; Potiron, Andre; and Deysson, Jean-Yves, 4,521,353, Cl. 264-8.000.

Potter, Steven E.: *See*—
Engelke, Claude W.; Sutton, Gerald E.; and Potter, Steven E., 4,521,354, Cl. 264-46.600.

Poulsen, Bo, to AGA AB. Encoded cap for a pressurized gas cylinder. 4,521,676, Cl. 235-375.000.

Powers, John H.; and Remaley, Edward G., to Aluminum Company of America. One step sealing process. 4,521,463, Cl. 427-435.000.

PPG Industries, Inc.: *See*—
Heithoff, Robert B., 4,521,235, Cl. 65-29.000.
Heithoff, Robert B., 4,521,238, Cl. 65-135.000.
Pickens, Stanley R., 4,521,283, Cl. 204-59.00R.

Prawdzik, Joseph F., to Tiger Products, Inc. Kicker wheel with replaceable surface for bowling apparatus. 4,521,019, Cl. 273-49.000.

Precision Metal Fabricators, Inc.: *See*—
Lenhart, Ronald A., 4,521,130, Cl. 406-86.000.

Preikschat, Fritz K. Target simulation system. 4,521,780, Cl. 343-17.700.

Prescher, Gunter: *See*—
Arntz, Dietrich; Prescher, Gunter; Burkhardt, Werner; Heilos, Johannes; and Manner, Reinhard, 4,521,618, Cl. 562-535.000.

Presto Lock, Inc.: *See*—
Bako, Lazlo, 4,520,641, Cl. 70-312.000.

Price, Martin B.: *See*—
Rehfuss, John W.; Hazelwood, Louis S.; Price, Martin B.; and Zilke, Robert W., Jr., 4,521,489, Cl. 428-412.000.

Price, William E.; Galloway, Louie A., III; Lowrey, Charles B.; and Lewis, Donald R., to Nuclear Monitoring Systems & Management Corporation. Apparatus and method for monitoring stored material. 4,521,372, Cl. 376-250.000.

Price, William M. Nutcracker for cracking hard-shell nuts such as black walnuts and macadamia nuts. 4,520,719, Cl. 99-578.000.

Prince Corporation: *See*—
Cody, Michael J.; and Spykerman, Scott A., 4,521,051, Cl. 296-97.00H.

Pringle, Ronald E., to Camco, Incorporated. Well flow control device. 4,520,870, Cl. 166-317.000.

Pritchett, James D.: *See*—
Jordan, William D.; Hundt, Roger C.; and Pritchett, James D., 4,521,827, Cl. 361-386.000.

Pritzkow, Dennis H., to General Electric Company. Modular radiation-detecting array. 4,521,689, Cl. 250-385.000.

Proksa, Ferdinand: *See*—
Althausen, Ferdinand; Proksa, Ferdinand; and Osinski, Ulrich, 4,520,947, Cl. 222-63.000.

Propane Carburetion Systems, Inc.: *See*—
Batchelor, William H., 4,520,785, Cl. 123-525.000.

Prosenbauer, Otto, to Inject Star Pokelmaschinen Gesellschaft m.b.H. Equipment for massaging of meat. 4,520,718, Cl. 99-535.000.

Proud, Joseph M.: *See*—
Byszewski, Wojciech W.; Budinger, A. Bowman; and Proud, Joseph M., 4,521,718, Cl. 315-99.000.

Prueter, Elton D.: *See*—
Laursen, Larry J.; and Prueter, Elton D., 4,520,547, Cl. 29-469.500.

Prvanoff, Ivan. Vehicle supported collapsible bed with shelter cover. 4,521,048, Cl. 296-160.000.

Purdes, Andrew J., to Texas Instruments Incorporated. Plasma etch chemistry for anisotropic etching of silicon. 4,521,275, Cl. 156-643.000.

Putney, Scott D.: *See*—
Benkovic, Stephen J.; Putney, Scott D.; and Schimmel, Paul R., 4,521,509, Cl. 435-6.000.

Putt, James C.: *See*—
Fisher, John M.; and Putt, James C., 4,520,838, Cl. 137-69.000.

Puttemanns, Louis; and Plas, Jean J. R. Elevated airport runway, taxiway, or threshold edge light with sealed glass dome. 4,521,836, Cl. 362-145.000.

Q-Dot, Inc.: *See*—
Gradl, David A., 4,521,752, Cl. 333-165.000.

Qsine Corporation Limited: *See*—
Saruwatari, Minoru, 4,521,059, Cl. 301-36.00R.

Quest, Thomas A. Orthopaedic apparatus. 4,520,803, Cl. 128-80.00A.

Quinlan, William P.: *See*—
Dix, Gary L.; Heim, Lloyd S.; Herald, Robert F.; and Quinlan, William P., 4,521,884, Cl. 371-15.000.

Quintin, Philip G.: *See*—
Cook, Brian A.; and Quintin, Philip G., 4,521,839, Cl. 362-238.000.

Rado, David J.; and Coste, Steven D., to Otis Elevator Company. Elevator leveling signal error and correction. 4,520,904, Cl. 187-29.00R.

Radt, Walter: *See*—
Schmitt, Hans-Georg; Reinecke, Paul; Paulus, Wilfried; Genth, Hermann; and Radt, Walter, 4,521,412, Cl. 514-244.000.

Raghunathan, Kuppuswamy, to Motorola, Inc. Voltage detecting circuit. 4,521,696, Cl. 307-350.000.

Rajkanan, Kamal; and Multani, Jagir S., to General Instrument Corporation. Memory implant profile for improved channel shielding in electrically alterable read only memory semiconductor device. 4,521,796, Cl. 357-23.500.

Rajotte, Paul T.: *See*—
Morris, Robert A.; Kiesel, George W.; and Rajotte, Paul T., 4,521,824, Cl. 361-45.000.

Ramer, Richard M.: *See*—
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., 4,521,392, Cl. 423-317.000.

Rampe, John F., to Jepmar. Bowl-type vibratory finishing machine. 4,520,598, Cl. 51-163.200.

Rand, Roy E., to Imatron Associates. Electron beam control assembly and method for a scanning electron beam computed tomography scanner. 4,521,900, Cl. 378-137.000.

Rand, Roy E., to Imatron Associates. Scanning electron beam computed tomography scanner with ion aided focusing. 4,521,901, Cl. 378-138.000.

Randall, Malcolm W.: *See*—
Davis, Walter L.; Messenger, Dale; and Randall, Malcolm W., 4,520,702, Cl. 83-71.000.

Ranghelli, Joseph C.; and La Bella, Joseph A., to International Telephone and Telegraph Corporation. Tuning and temperature compensation arrangement for microwave resonators. 4,521,754, Cl. 333-224.000.

Rantell, Terry D.: *See*—
Clarke, James W.; Kimber, Geoffrey M.; Rantell, Terry D.; and Snape, Colin E., 4,521,291, Cl. 208-8.0LE.

Rasmussen, Donald O.; Chow, William C.; and Davio, Franklin J., to Kennedy Company. Cartridge tape drive having vacuum auto-threading. 4,520,970, Cl. 242-195.000.

Rathbun, William H.: *See*—
Pasko, Walter J., Jr.; and Rathbun, William H., 4,520,556, Cl. 29-606.000.

Rau, Bantwal R.; Glaeser, Christopher D.; and Kuekes, Philip J., to TRW Inc. Random access memory device. 4,521,874, Cl. 365-221.000.

Raupuk, Milton W., Jr.; and Pennington, Edward M., to United States of America, Navy. Automatic vacuum urinal flush mechanism. 4,520,513, Cl. 4-302.000.

Ray, Joe R., to Noble Automated Systems, Inc. Method of and apparatus for preventing segregation of aggregate. 4,520,918, Cl. 198-640.000.

Ray, Joe R., to Noble Automated Systems, Inc. Variable stroke drive mechanism. 4,520,920, Cl. 198-761.000.

Raychem Corporation: *See*—
Penneck, Richard J., 4,521,549, Cl. 523-173.000.
Tondre, Stephen L.; and Lunk, Hans E., 4,521,485, Cl. 428-383.000.

Rayl, Martin: *See*—
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Raymor, Willard E.; and Hedegard, Peter L. Method for washing a fibrous mat. 4,521,255, Cl. 134-33.000.

Raytheon Company: *See*—
Schloemann, Ernst F. R. A., 4,521,753, Cl. 333-204.000.
RCA Corporation: *See*—
Bendell, Sidney L., 4,521,804, Cl. 358-51.000.
Brown, Richard, 4,520,561, Cl. 29-840.000.
Butterwick, Gilbert N., 4,521,713, Cl. 313-378.000.
D'Augustine, Frank T., 4,521,501, Cl. 430-24.000.
Dingwall, Andrew G. F., 4,521,703, Cl. 307-530.000.
Eide, Daniel L., 4,521,026, Cl. 277-134.000.
Faulkner, Richard D.; and McDonie, Arthur F., 4,521,715, Cl. 313-531.000.
Fisher, Albert W., 4,520,554, Cl. 29-591.000.
Halsey, Jay F.; and Briggs, Jeffrey M., 4,520,604, Cl. 52-200.000.
Nigborowicz, John J.; and Friedline, Karl L., 4,521,810, Cl. 358-181.000.
Stoughton, John W.; and Willis, Donald H., 4,521,811, Cl. 358-243.000.
Vaccaro, Frank E.; and Kowalik, John, 4,521,714, Cl. 313-422.000.
Whitley, George J.; Rayl, Martin; and Squire, William, 4,520,549, Cl. 29-566.300.
Wine, Charles M., 4,521,916, Cl. 455-182.000.
Rea, Gerald M.; Stoff, William G.; and Zens, John F., to General Motors Corporation. Shroud top vent grille retaining means. 4,521,050, Cl. 296-192.000.
Reaser, Brian K. Bed sheet installation and retention. 4,520,518, Cl. 5-498.000.
Rebafka, Walter; Heilen, Gerd; Halbritter, Klaus; and Franzischka, Wolfgang, to BASF Aktiengesellschaft. Preparation of pyridines or pyrroles from α,ω-dinitriles. 4,521,602, Cl. 546-184.000.
Rebman, Jack, to Lord Corporation. Tactile sensor for an industrial robot or the like. 4,521,685, Cl. 250-229.000.
Redden, Charlotte S.: *See*—
Pelham, Russell W.; Redden, Charlotte S.; Eshkol, Aliza; and Stiles, Gerald E., 4,521,407, Cl. 424-95.000.
Redding, John R.; and Hunter, Patrick F., to Redding, John Robert. Bale handling machine. 4,521,149, Cl. 414-44.000.
Redding, John Robert: *See*—
Redding, John R.; and Hunter, Patrick F., 4,521,149, Cl. 414-44.000.
Reddy, Chitranjan N., to Texas Instruments Incorporated. High-speed low-power delayed clock generator. 4,521,701, Cl. 307-482.000.
Reese, Morris T.: *See*—
Aultman, William H.; and Reese, Morris T., 4,521,830, Cl. 361-433.000.
Rehfuss, John W.; Hazelwood, Louis S.; Price, Martin B.; and Zilke, Robert W., Jr., to Reliance Universal, Inc. Low temperature cure coating system suitable for metal and plastic substrates. 4,521,489, Cl. 428-412.000.
Rehrig Pacific Company: *See*—
Hagan, John A.; and Lafferty, James, 4,520,941, Cl. 220-72.000.
Reichenbach, Dean H.; Stang, John H.; Cummings, Lewis W.; Glasson, Richard E.; and Ruthmansdorfer, David A., to Cummins Engine Company, Inc. Turbocharged internal combustion engine. 4,520,627, Cl. 60-599.000.
Reichert, Gunter; Mainzer, Franz; Lehmann, Kurt; and Niermann, Hermann, to Hoechst Aktiengesellschaft. Method for controlling and optionally regulating the level of liquid P_2S_5 in a cooling device. 4,520,631, Cl. 62-188.000.
Reichmanis, Elsa; and Wilkins, Cletus W., Jr., to AT&T Bell Laboratories. Bilevel resist. 4,521,274, Cl. 156-643.000.
Reid, John H. Conservation of momentum in a barrier oxidation ditch. 4,521,307, Cl. 210-194.000.
Reiff, Harro, to Karl Mengele & Sohne. Device for stacking cut plates in plate shears. 4,520,933, Cl. 209-606.000.
Reilly, Kenneth T.: *See*—
Douglas, Alan D.; and Reilly, Kenneth T., 4,521,381, Cl. 423-49.000.
Reinecke, Paul: *See*—
Maurer, Fritz; Brandes, Wilhelm; Kuck, Karl-Heinz; Reinecke, Paul; and Scheinpflug, Hans, 4,521,420, Cl. 514-259.000.
Schmitt, Hans-Georg; Reinecke, Paul; Paulus, Wilfried; Genth, Hermann; and Radt, Walter, 4,521,412, Cl. 514-244.000.
Reliance Electric Company: *See*—
Kamiller, Neil A., 4,521,841, Cl. 363-45.000.
Kammiller, Neil A., 4,521,842, Cl. 363-71.000.
Niese, Leo J.; and Sharlow, Gary R., 4,520,853, Cl. 141-168.000.
Reliance Universal, Inc.: *See*—
Rehfuss, John W.; Hazelwood, Louis S.; Price, Martin B.; and Zilke, Robert W., Jr., 4,521,489, Cl. 428-412.000.
Remaley, Edward G.: *See*—
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Renato Bosisio: *See*—
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Renault Vehicules Industriels: *See*—
Michel, Robert, 4,520,840, Cl. 137-259.000.
Renk, Rolf, to General Motors Corporation. Connecting element for gearshift linkages. 4,520,686, Cl. 74-473.00R.
Renken, Terry L.: *See*—
Sanderson, John R.; Watts, Lewis W., Jr.; Vanderpool, Steven H.; and Renken, Terry L., 4,521,609, Cl. 549-533.000.
Renkey, Albert L.: *See*—
Kernion, Mark C.; and Renkey, Albert L., 4,521,357, Cl. 264-63.000.
Renzi, Fiorenzo: *See*—
Romano, Ugo; Renzi, Fiorenzo; Rivetti, Franco; and Gagliardi, Claudio, 4,521,577, Cl. 526-261.000.
Republic Steel Corporation: *See*—
Sobolewski, Robert; and Eberle, David N., 4,520,861, Cl. 164-473.000.
Research Corporation: *See*—
Benkovic, Stephen J.; Putney, Scott D.; and Schimmel, Paul R., 4,521,509, Cl. 435-6.000.
Respiratory Care, Inc.: *See*—
Cerny, David E., 4,521,038, Cl. 285-24.000.
Rexroth-Sigma: *See*—
Isaac, Olivier; and Pignolet, Louis, 4,520,845, Cl. 137-624.270.
Reynolds, Collins J., III, to Avimage, Inc. Aviation weather information dissemination system. 4,521,857, Cl. 364-439.000.
Rhim, Won-Kyu; Saffren, Melvin M.; and Elleman, Daniel D., to United States of America, National Aeronautics and Space Administration. Closed loop electrostatic levitation system. 4,521,854, Cl. 364-400.000.
Rhone-Poulenc Chimie De Base: *See*—
Jenck, Jean, 4,521,614, Cl. 560-193.000.
Rhyne, James R., to International Business Machines Corporation. Use of inversions in the near realtime control of selected functions in interactive buffered raster displays. 4,521,770, Cl. 340-703.000.
Riccio, Louis M.; and Bosna, Alexander. Method and apparatus for applying metal cladding on surfaces and products formed thereby. 4,521,475, Cl. 428-142.000.
Rice, Kenner C., to United States of America, Health & Human Services. Practical total synthesis unnatural enantiomers of opium-derived morphinans. 4,521,601, Cl. 546-45.000.
Richter, Ekkehard; Korbacher, Werner; Knoblauch, Karl; and Giessler, Klaus, to Bergwerksverband GmbH. Method of producing a methane-rich gas mixture from mine gas. 4,521,221, Cl. 48-196.00R.
Ricoh Company, Ltd.: *See*—
Jinnai, Koichiro, 4,521,789, Cl. 346-140.00R.
Mayer, Edward F., 4,521,095, Cl. 355-3.0FU.
Miyake, Kiyoshi; and Kaneko, Hiroko, 4,521,081, Cl. 350-357.000.
Okazaki, Hideo; Imagome, Hiroshi; Suzuka, Susumu; and Sakai, Kiyoshi, 4,521,605, Cl. 548-440.000.
Sakai, Katsuo; and Demizu, Hiromi, 4,521,502, Cl. 430-42.000.
Sakuma, Seiitj; and Karasawa, Shuichi, 4,521,504, Cl. 430-57.000.
Sugiyama, Hiroaki, 4,520,695, Cl. 81-3.070.
Rider, Billie F., to Rockwell International Corporation. Cross-axis acceleration compensation for angular rate sensing apparatus. 4,520,669, Cl. 73-510.000.
Ridge, Inc.: *See*—
Peugeot, Richard S., 4,521,902, Cl. 378-138.000.
Riedhammer, Josef: *See*—
Hovorka, Reiner; and Riedhammer, Josef, 4,520,712, Cl. 91-505.000.
Rieke, Erwin: *See*—
Lundstrom, Kurt I.; Arwin, Hans R.; Rieke, Erwin; Sielaff, Gunter; and Hennrich, Norbert, 4,521,522, Cl. 436-525.000.
Rieter Machine Works Limited: *See*—
Stalder, Herbert; and Briner, Emil, 4,520,532, Cl. 19-244.000.
Righini, Giancarlo: *See*—
Sottini, Stefano; Brenci, Massimo; Righini, Giancarlo; Falciai, Riccardo; Russo, Vera; and Scheggi, Verga A., 4,521,070, Cl. 350-96.150.
Riha, Gerd; and Veith, Richard, to Siemens Aktiengesellschaft. Electronic component functioning with reflected acoustic waves. 4,521,751, Cl. 333-151.000.
Rimbert, Jean-Francis: *See*—
Goursat, Albert-Gilbert; Vernet, Gilles; Rimbert, Jean-Francis; Foulard, Jean; Darle, Thierry; and Bigot, Jean, 4,521,244, Cl. 75-0.50B.
Rinell, Steven J.: *See*—
St. Vincent, Valerie A.; Heinen, Frank B.; and Rinell, Steven J., 4,520,805, Cl. 128-80.00R.
Riordan, William J.: *See*—
Walter, Carl W.; and Riordan, William J., 4,521,180, Cl. 431-25.000.
Risse, Wilhelm: *See*—
Heitz, Walter; and Risse, Wilhelm, 4,521,584, Cl. 528-214.000.
Rivetti, Franco: *See*—
Romano, Ugo; Renzi, Fiorenzo; Rivetti, Franco; and Gagliardi, Claudio, 4,521,577, Cl. 526-261.000.
RMC Rotary Motor Company AG: *See*—
Kathmann, Peter B., 4,521,168, Cl. 418-137.000.
Robert Bosch GmbH: *See*—
Eschrich, Gerhard; and Schwab, Manfred, 4,520,694, Cl. 74-858.000.
Kubach, Hans, 4,520,779, Cl. 123-357.000.
Sitter, Erhard, 4,520,774, Cl. 123-300.000.
Robert Finke GmbH: *See*—
Finke, Robert G., 4,520,938, Cl. 215-220.000.
Roberts, Thomas G.; and Honeycutt, Thomas L., to United States of America, Army. Dual cavity laser gyro. 4,521,110, Cl. 356-350.000.
Robinson, Paul R., to Commonwealth of Australia, The. Loop retention device for hook operated bomb arming solenoids. 4,520,711, Cl. 89-1.50D.
Robortaccio, Rocco J.: *See*—
Blumberg, Richard J.; Brenner, Stewart; and Robortaccio, Rocco J., 4,521,700, Cl. 307-456.000.
Roche , Bernard. Telephony apparatus having filter capacitor switched to undergo discrete phase jumps. 4,521,883, Cl. 370-100.000.

Rockwell International Corporation: *See*—
Anderson, Eric G., 4,521,679, Cl. 235-492.000.
Debrunner, Paul E., Jr., 4,520,843, Cl. 137-469.000.
Rider, Billie F., 4,520,669, Cl. 73-510.000.

Roden, Dianne M.: *See*—
Anderson, Patricia A.; Hagens, Roger G.; and Roden, Dianne M., 4,521,321, Cl. 252-49.300.

Rodler, Waldo E., Jr., to FMC Corporation. Hydrostatic reaction transmission. 4,520,691, Cl. 74-790.000.

Roettgen, Leslie A.; Webber, Beth A.; Brooks, Robert M.; and Layman, Robert J., to Cummins Engine Company. Low flow cooling system and apparatus. 4,520,767, Cl. 123-41.100.

Roff, Robert W. Valve. 4,520,839, Cl. 137-202.000.

Rogers, George T.: *See*—
Severance, Wayne S., Jr.; and Rogers, George T., 4,521,666, Cl. 217-121.0PY.

Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., to Polaroid Corporation. Optical device including birefringent polyhydrazide polymer. 4,521,588, Cl. 528-363.000.

Roggenkamp, Hans-Gunther: *See*—
Kiesewetter, Holger; Myrenne, Heinz; and Roggenkamp, Hans-Gunther, 4,521,729, Cl. 324-71.100.

Rohde, Erwin: *See*—
Eberhardt, Wolfgang; Hoffmann, Dietrich; Kriechbaum, Karl; and Rohde, Erwin, 4,521,654, Cl. 200-146.00R.

Rohde & Schwarz GmbH & Co., KG: *See*—
Huber, Franz R.; and Stark, Axel, 4,521,913, Cl. 455-121.000.

Rohm GmbH: *See*—
Arndt, Peter J.; Ludwig, Walter; Munzer, Manfred; Siol, Werner; and Wenzel, Franz, 4,521,567, Cl. 525-261.000.
Schnee, Reiner; and Masanek, Jurgen, 4,521,552, Cl. 523-313.000.

Rohr, Willy; Wollgarten, Kurt; and Vogel, Rudolf, to Sulzer Brothers Limited. Gripper for inserting the weft in a rapier weaving machine. 4,520,851, Cl. 139-448.000.

Rohr, Wolfgang: *See*—
Plath, Peter; Rohr, Wolfgang; Schwendemann, Volker; and Wuerzer, Bruno, 4,521,604, Cl. 548-301.000.

Roline, Glenn M.: *See*—
Thompson, David L.; Roline, Glenn M.; and Harrington, Richard J., 4,520,825, Cl. 128-422.000.

Rollet, Jean: *See*—
Cholley, Henri E.; Laupretre, Jean J.; and Rollet, Jean, 4,521,072, Cl. 350-96.230.

Rolls-Royce Limited: *See*—
Pask, George, 4,521,159, Cl. 416-174.000.

Romano, Ugo; Renzi, Fiorenzo; Rivetti, Franco; and Gagliardi, Claudio, to Enichimica S.p.A. Liquid polymerizable compositions of a carbonate oligomer, an allylcarbonate and vinyl acetate. 4,521,577, Cl. 526-261.000.

Rombouts, Andre H. Supports for heating bodies intended for annealing furnaces. 4,520,789, Cl. 126-91.00A.

Romeo, Frank C.: *See*—
Dunn, Jimmy L.; Mayo, George L.; and Romeo, Frank C., 4,520,550, Cl. 29-568.000.

Rood, Robert M.: *See*—
Wulfing, James J.; and Rood, Robert M., 4,520,969, Cl. 242-71.800.

Roos, Ernst; and Kircher, Klaus, to Bayer Aktiengesellschaft. Arylsulphonyl hydrazones as blowing agents. 4,521,542, Cl. 521-89.000.

Rose, Robert M.: *See*—
Kuehnle, Manfred R.; Perry, George J.; and Rose, Robert M., 4,521,097, Cl. 355-3.00R.

Rosenberg, Wilbert: *See*—
Daigle, Ronald H., 4,520,510, Cl. 2-452.000.

Rosencwaig, Allan, to Therma-Wave, Inc. Method for detection of thermal waves with a laser probe. 4,521,118, Cl. 374-5.000.

Rosenquist, Niles R., to General Electric Company. Polycarbonate resin impact modified with polyolefins and containing paraffin derivatives. 4,521,562, Cl. 524-490.000.

Rosenthal Aktiengesellschaft: *See*—
Keller, Hartmut; Krauth, Axel; and Kriener, Roswitha, 4,521,356, Cl. 264-60.000.

Rosinski, Edward J.; and Schwartz, Albert B., to Mobil Oil Corporation. Promotion of cracking catalyst octane yield performance. 4,521,298, Cl. 208-120.000.

Ross, Hugh M.; and Grocock, Peter G., to Davy McKee (Poole) Limited. Feeding thin foil-like material into a gap between a pair of rotatable rolls. 4,520,645, Cl. 72-250.000.

Rosselet, Ernest: *See*—
Kudelski, Stefan; and Rosselet, Ernest, 4,521,706, Cl. 310-67.00R.

Rossignol, Jean F., to SmithKline Beckman Corporation. Quinate salts of the antimalarial compound mefloquine. 4,521,424, Cl. 514-314.000.

Rossler, Kurt. Waste comminuting apparatus. 4,520,964, Cl. 241-55.000.

Rothenberg, Lee M., Jr., to International Honeycomb Corporation. Toy construction kit. 4,521,203, Cl. 446-106.000.

Rotter, Carl W. Obstetric device and method. 4,520,807, Cl. 128-132.00D.

Rouleau, Robert J. Hanging bracket for suspending overhead signs. 4,520,984, Cl. 248-489.000.

Rouly, Eric; Baquet, Philippe; and Dubuit, Jean-Louis, to Societe d'Exploitation des Machines Dubuit. Flat silk-screen printing machine with movable pivoted support. 4,520,726, Cl. 101-123.000.

Roussel Uclaf: *See*—
Martel, Jacques; Buendia, Jean; and Nezot, Francois, 4,521,331, Cl. 252-522.00R.

Rowe, Donald R.: *See*—
Zackay, Victor F.; and Rowe, Donald R., 4,521,530, Cl. 502-218.000.

Roy, Richard D.: *See*—
Barthel, Richard C.; and Roy, Richard D., 4,521,722, Cl. 318-578.000.

RPC Corporation: *See*—
Appleman, William S.; and Sturgill, James D., 4,521,044, Cl. 294-82.240.

RTE Corporation: *See*—
Link, Edwin A., 4,521,823, Cl. 361-38.000.

Rubber Millers, Inc.: *See*—
Day, John T., 4,521,306, Cl. 210-159.000.

Ruberl, Ernst, to AKG Akustische u.Kino-Gerate Gesellschaft m.b.H. Impedance transformer circuit. 4,521,741, Cl. 330-277.000.

Rudolf, Peter: *See*—
Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Ohlinger, Manfred; Wilfinger, Hans J.; Pfannebecker, Emil; and Duffner, Paul, 4,521,527, Cl. 502-184.000.

Ruehl, William E.: *See*—
Frano, Francis G.; and Ruehl, William E., 4,520,748, Cl. 116-70.000.

Ruhl, Erich; and Thenner, Johann, to Ruhl, Erich. Non-flammable rigid foam and its use as a building material. 4,521,543, Cl. 521-103.000.

Ruschke, Rick R., to Baxter Travenol Laboratories, Inc. Solution administration set. 4,521,212, Cl. 604-126.000.

Russell, Philip P.; Niu, Tyan-Faung; and Holland, Frederic A., to Xerox Corporation. Simultaneous formation and deposition of multiple ribbon-like streams. 4,521,457, Cl. 427-286.000.

Russell, Roy R. B., to Secretary of State of Social Services in Her Britannic Majesty's Government of the United Kingdon of Great Brtian and Northern Ireland, The. Protection against dental caries. 4,521,513, Cl. 435-68.000.

Russell, Stanley L.: *See*—
Gueldenpfennig, Klaus; Russell, Stanley L.; Oswald, William A.; Breidenstein, Charles J.; and Narula, Karam V., 4,521,879, Cl. 370-62.000.

Russell, William A.: *See*—
Babbel, John H.; Russell, William A.; and Steele, Robert B., 4,521,870, Cl. 364-900.000.

Russo, Vera: *See*—
Sottini, Stefano; Brenci, Massimo; Righini, Giancarlo; Falciai, Riccardo; Russo, Vera; and Scheggi, Verga A., 4,521,070, Cl. 350-96.150.

Rutherford, Howard J.; and Withycombe, Donald A., to International Flavors & Fragrances Inc. Process for forming functional fluid and solid-containing thermoplastic films, uses thereof and process for producing same. 4,521,541, Cl. 521-79.000.

Rutherford, John M., Jr.: *See*—
Lorenz, Donald H.; Murphy, Edward J.; and Rutherford, John M., Jr., 4,521,404, Cl. 424-71.000.

Ruthmansdorfer, David A.: *See*—
Reichenbach, Dean H.; Stang, John H.; Cummings, Lewis W.; Glasson, Richard E.; and Ruthmansdorfer, David A., 4,520,627, Cl. 60-599.000.

Ryan, Charles P.: *See*—
Wilhite, John E.; Shelly, William A.; and Ryan, Charles P., 4,521,850, Cl. 364-200.000.

Ryan, John O., to Ampex Corporation. Demodulator for pulse width modulated signals. 4,521,736, Cl. 329-102.000.

Ryan, William P.; and Schroeder, Thaddeus, to General Motors Corporation. Method of locating engine top dead center position. 4,520,658, Cl. 73-117.300.

Ryczek, Lawrence J.; and Janutka, William J., to Eaton Corporation. Comparator timer with dual function adjustment. 4,521,694, Cl. 307-266.000.

Ryczek, Lawrence J.; and Janutka, William J., to Eaton Corporation. Adjustable frequency oscillator. 4,521,748, Cl. 331-108.00D.

Ryntz, Edward F., Jr.; and Bommarito, John J., to General Motors Corporation. Chill-enhanced lost foam casting process. 4,520,858, Cl. 164-34.000.

S.N.E.C.M.A.: *See*—
Debeneix, Pierre, 4,520,974, Cl. 244-54.000.

Sacca, Demetrio B.; Sanderson, Edward H.; and Beatenbough, Paul K., to General Motors Corporation. Single inlet/outlet-tank U-shaped tube heat exchanger. 4,520,867, Cl. 165-144.000.

Sachs, Bertram, to Siemens Aktiengesellschaft. Method for the manufacture of a device for the read-out of a two-dimensional image pattern with an array. 4,521,667, Cl. 219-121.0LJ.

Sado, Ryoichi; and Tahara, Kazutoki, to Shin-Etsu Polymer Co., Ltd. Method for manufacturing an elastic composite body with metal wires embedded therein. 4,520,562, Cl. 29-878.000.

Saffer, Gary M.; Lambert, Gerard L.; and Stern, Howard R., to Mattel, Inc. Track for toy vehicles. 4,521,206, Cl. 446-444.000.

Saffren, Melvin M.: *See*—
Rhim, Won-Kyu; Saffren, Melvin M.; and Elleman, Daniel D., 4,521,854, Cl. 364-400.000.

Sagami Chemical Research Center: *See*—
Oyama, Kiyotaka; Irino, Shigeaki; Harada, Tsuneo; and Nakamura, Masao, 4,521,514, Cl. 435-70.000.

Sagara, Seiji: *See*—
Yonemori, Takaji; and Sagara, Seiji, 4,521,100, Cl. 355-8.000.

Saglio, Robert: *See*—
Pigeon, Michel; and Saglio, Robert, 4,521,150, Cl. 414-749.000.

Sagness, Ronald L.; and Peterson, David A., to Neshem-Peterson, Inc. Air heating furnace. 4,520,790, Cl. 126-109.000.

Sahatjian, Ronald A.: *See—*
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,521,588, Cl. 528-363.000.
Saint-Amour, John D. Thickness measuring. 4,520,672, Cl. 73-622.000.
Saint-Michel, Jacques A.; Chabrerie, Jean-Pierre; and Mailfert, Alain, to Etat Francais. Direct current dynamoelectric machines with auxiliary equalizer poles. 4,521,709, Cl. 310-186.000.
St. Pierre, Philippe D.; and Buckner, Michael T., to General Electric Company. Resin-bonded grinding elements with dual coated diamond grit for dry grinding and wet grinding cemented carbide workpieces. 4,521,222, Cl. 51-295.000.
St. Regis Corporation: *See—*
Keppel, Stephen C.; Newton, Donald O.; and Salt, Stephen R., 4,521,910, Cl. 383-10.000.
Vance, Robert L., 4,521,911, Cl. 383-20.000.
St. Vincent, Valerie: *See—*
St. Vincent, Valerie A.; Heinen, Frank B.; and Rinell, Steven J., 4,520,805, Cl. 128-80.00R.
St. Vincent, Valerie A.; Heinen, Frank B.; and Rinell, Steven J., to St. Vincent, Valerie. Abductor turntable. 4,520,805, Cl. 128-80.00R.
Saito, Eiichi: *See—*
Ohtsuka, Shuichi; Aotsuka, Yasuo; and Saito, Eiichi, 4,521,103, Cl. 355-14.00D.
Saito, Hajime; and Urakawa, Tetsuro, to Toshiba Ceramics Co. Limited; and Saito, Hajime. Method of manufacturing β type silicon nitride whiskers. 4,521,393, Cl. 423-344.000.
Saito, Seiji: *See—*
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; Koumura, Noboru; and Kazuma, Koji, 4,521,805, Cl. 358-75.000.
Saito, Yoshitaka. Automatic stone cutter. 4,520,880, Cl. 175-51.000.
Saito, Yuichi: *See—*
Furukawa, Hiroshi; and Saito, Yuichi, 4,521,587, Cl. 526-340.200.
Saitou, Kazuo: *See—*
Morimoto, Masao; Sano, Shoji; Yoshimi, Kazuyoshi; and Saitou, Kazuo, 4,521,153, Cl. 415-146.000.
Sakaguchi, Yuriko: *See—*
Obitsu, Masamichi; Hori, Takahiro; Koinuma, Toyoji; and Sakaguchi, Yuriko, 4,521,249, Cl. 106-12.000.
Sakai, Katsuo; and Demizu, Hiromi, to Ricoh Company, Ltd. Color recording method. 4,521,502, Cl. 430-42.000.
Sakai, Kiyoshi: *See—*
Okazaki, Hideo; Imagome, Hiroshi; Suzuka, Susumu; and Sakai, Kiyoshi, 4,521,605, Cl. 548-440.000.
Sakai, Shuzo: *See—*
Miyake, Toshio; Sakai, Shuzo; and Shibuya, Takashi, 4,521,252, Cl. 127-46.300.
Sakai, Takuo: *See—*
Kawamura, Yasuo; Nishiyama, Tadashi; Itoh, Tomiyoshi; and Sakai, Takuo, 4,521,406, Cl. 424-94.000.
Sakamoto, Atsushi: *See—*
Miyaji, Naotaka; Sakamoto, Atsushi; and Iwahara, Makoto, 4,521,908, Cl. 381-92.000.
Sakamoto, Keiji; and Toyozawa, Yukio, to Fanuc Ltd. Apparatus for processing energy regenerated by an AC motor. 4,521,724, Cl. 318-762.000.
Sakamoto, Seiya: *See—*
Ono, Yoshio; and Sakamoto, Seiya, 4,521,814, Cl. 358-296.000.
Sakamoto, Shinichi: *See—*
Kimura, Kazuo; Taneda, Yukinori; Tsuyuki, Shinichi; Suzuki, Shun; Hashimoto, Yoshio; and Sakamoto, Shinichi, 4,520,965, Cl. 242-7.05B.
Sakamoto, Takao; and Abe, Tadafumi, to Tachikawa Spring Co., Ltd. Carpet with fusion-cut through bore and its manufacture method. 4,521,473, Cl. 428-82.000.
Sakane, Kazuo: *See—*
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,521,413, Cl. 514-203.000.
Sakaoka, Gouji; and Ishikawa, Takashi, to Pentel Kabushiki Kaisha. Mechanical pencil. 4,521,126, Cl. 401-65.000.
Sakata, Jiro: *See—*
Yamamoto, Minoru; Sakata, Jiro; and Doi, Haruo, 4,521,236, Cl. 65-31.000.
Sakuma, Seiitj; and Karasawa, Shuichi, to Ricoh Company, Ltd. Composite photosensitive material for use in electrophotography. 4,521,504, Cl. 430-57.000.
Sakurai, Noriaki: *See—*
Suzuki, Shoichi; Ohta, Wataru; Sakurai, Noriaki; and Yamashita, Michio, 4,521,133, Cl. 405-195.000.
Saldert, Bertil K.: *See—*
Bengtsson, Bengt L.; Palmlin, Peter; and Saldert, Bertil K., 4,521,439, Cl. 426-509.000.
Sale, Francis M.: *See—*
Mills, Harold E.; Murdock, David L.; Ramer, Richard M.; and Sale, Francis M., 4,521,392, Cl. 423-317.000.
Sale Tilney Technology Plc.: *See—*
Smythe, Kenneth R., 4,521,462, Cl. 427-421.000.
Saleeb, Fouad Z.: *See—*
Zeller, Bary L.; Kaleda, William W.; and Saleeb, Fouad Z., 4,521,438, Cl. 426-271.000.
Sallee, Gary F.: *See—*
Baker, William; Smith, Gordon H.; Beach, Xio I.; Sallee, Gary F.; and Stein, Jeffrey I., 4,521,915, Cl. 455-165.000.
Salomonsson, Goran; Borjesson, Per O.; Mandersson, Bengt; Holmer, Nils-Gunnar; and Lindstrom, Kjell. Method and apparatus for generating short ultrasonic echo pulses. 4,520,670, Cl. 73-602.000.
Salt, Stephen R.: *See—*
Keppel, Stephen C.; Newton, Donald O.; and Salt, Stephen R., 4,521,910, Cl. 383-10.000.
Samish, Norman C.; and Pohlenz, Jack B., to Shell California Production Inc. NO_x reduction in flue gas. 4,521,388, Cl. 423-235.000.
Sample, Thomas E., Jr.: *See—*
Chen, Robert G.; Patel, Arvind D.; and Sample, Thomas E., Jr., 4,521,578, Cl. 526-288.000.
Samuels, Abe; Yamashita, Keitaro; and Sasaki, Yoshitaka, to Hitachi Metals, Ltd.; and Speed-O-Print Business Machines Corp. Pressure fixing device. 4,521,184, Cl. 432-60.000.
Sandel, Bonnie B., to Olin Corporation. Selected N,1-disubstituted hydrazinecarboxamides and their use as antioxidants. 4,521,325, Cl. 252-77.000.
Sanderson, Edward H.: *See—*
Sacca, Demetrio B.; Sanderson, Edward H.; and Beatenbough, Paul K., 4,520,867, Cl. 165-144.000.
Sanderson, John R.; Watts, Lewis W., Jr.; Vanderpool, Steven H.; and Renken, Terry L., to Texaco Inc. Cycloalkane epoxides produced by air oxidation of cycloalkenes over lead zirconate as catalyst. 4,521,609, Cl. 549-533.000.
Sanechika, Kenichi: *See—*
Yamamoto, Takakazu; Yamamoto, Akio; and Sanechika, Kenichi, 4,521,589, Cl. 528-380.000.
Sangamo Weston, Inc.: *See—*
Aultman, William H.; and Reese, Morris T., 4,521,830, Cl. 361-433.000.
Welch, Edward W., 4,521,761, Cl. 338-174.000.
Sannikov, Jury I.: *See—*
Yarygin, Vladimir I.; Sannikov, Jury I.; Panchenko, Anatoly I.; Sychev, Anatoly P.; Vikharev, Ivan G.; Kuur, Vyacheslav P.; and Toguzov, Mels Z., 4,521,245, Cl. 75-21.000.
Sano, Shigehisa: *See—*
Ogino, Takao; Watanabe, Yoichi; and Sano, Shigehisa, 4,520,857, Cl. 152-527.000.
Sano, Shoji: *See—*
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Sano, Yasumasa; and Ohwada, Tetsuya, to NSK-Warner K.K.; and Nippon Kinzoku Co., Ltd. Buckle assembly. 4,520,538, Cl. 24-682.000.
Sanofi: *See—*
Nisato, Dino; Frigerio, Marco; and Miranda, Giovanna F., 4,521,428, Cl. 514-277.000.
Sanshin Kogyo Kabushiki Kaisha: *See—*
Nakahama, Ryoji, 4,521,202, Cl. 440-61.000.
Watanabe, Eifu, 4,521,201, Cl. 440-55.000.
Sanyo Electric Co., Ltd.: *See—*
Morimoto, Masao; Sano, Shoji; Yoshimi, Kazuyoshi; and Saitou, Kazuo, 4,521,153, Cl. 415-146.000.
Sara, Raymond V. Stress relieved metal/ceramic abradable seals. 4,521,496, Cl. 428-551.000.
Sarcia, Domenico S., to CVI Incorporated. Cryogenic refrigerator and heat source. 4,520,630, Cl. 62-6.000.
Saruwatari, Minoru, to Qsine Corporation Limited. Dual wheel adapter. 4,521,059, Cl. 301-36.00R.
Sarwin, Herbert S. Product control system for supermarkets and the like. 4,521,677, Cl. 235-385.000.
Sasaki, Shigeru: *See—*
Hayashi, Mitsuji; Endo, Hideo; Oishibashi, Hirotsugu; Aichi, Takeo; and Sasaki, Shigeru, 4,520,756, Cl. 118-699.000.
Sasaki, Tetsuo: *See—*
Otake, Noboru; Seto, Haruo; Sasaki, Tetsuo; Sugita, Masanori; Natori, Yohei; and Sueda, Noriyoshi, 4,521,339, Cl. 260-239.30B.
Sasaki, Tohru; Endoh, Hiroyuki; and Ohira, Seiichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinylidene fluoride resin filament and production thereof. 4,521,483, Cl. 428-373.000.
Sasaki, Yoshitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing semiconductor device. 4,521,448, Cl. 427-88.000.
Sasaki, Yoshitaka: *See—*
Samuels, Abe; Yamashita, Keitaro; and Sasaki, Yoshitaka, 4,521,184, Cl. 432-60.000.
Sasamura, Kohhei; and Mori, Takaro, to Victor Company of Japan, Limited. Circuit arrangement for magnetic recording apparatus having a multi-track head. 4,521,817, Cl. 360-46.000.
Sasao, Isao, to Mitsubishi Denki Kabushiki Kaisha. Elevator group control apparatus. 4,520,905, Cl. 187-29.00R.
Saskatchewan Power Corporation: *See—*
Moffat, Richard P., 4,521,894, Cl. 377-16.000.
Sassa, Yusei: *See—*
Takahashi, Kihei; and Sassa, Yusei, 4,520,559, Cl. 29-766.000.
Sato, Hideyori; Inaba, Nobuaki; Arai, Mitsuru; and Onzou, Michio, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic brake valve system. 4,520,625, Cl. 60-464.000.
Sato, Hirosi: *See—*
Suzuki, Akiyoshi; Sato, Hirosi; Omata, Takashi; and Kosugi, Masao, 4,521,082, Cl. 350-405.000.
Sato, Kunio: *See—*
Nakaya, Keiichi; and Sato, Kunio, 4,521,397, Cl. 423-474.000.
Sato, Yoshihiro, to Dai Nippon Insatsu Kabushiki Kaisha. Heat-sealable package blank for a video tape cassette. 4,520,927, Cl. 206-387.000.
Satoh, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Two-wheeled vehicle with offset wheel. 4,520,892, Cl. 180-219.000.
Satou, Hiroo: *See—*
Nanjo, Hirotoshi; Satou, Hiroo; and Takahashi, Osamu, 4,520,778, Cl. 123-352.000.

Sauers, Richard F.: *See*—
Hay, James V.; and Sauers, Richard F., 4,521,241, Cl. 71-92.000.
Saunier, Christian: *See*—
Briard, Rene ; Saunier, Christian; and Canova, Guy, 4,521,196, Cl. 434-20.000.
Sawada, Hideo; and Yata, Kiyoshi, to Hitachi, Ltd. Instruction storage. 4,521,872, Cl. 365-49.000.
Saxman, Edwin F., to Mack Trucks, Inc. Sun visor arrangement. 4,521,047, Cl. 296-97.00K.
Scalzi, Casper A.; and Schmalz, Richard J., to International Business Machines Corporation. Mechanism for accessing multiple virtual address spaces. 4,521,846, Cl. 364-200.000.
Scanlan, Harry J.; and Liljegren, Leif. Electric fluid heater employing pressurized helium as a heat transfer medium. 4,521,674, Cl. 219-299.000.
Schachar, Ronald A.; and Solin, Stuart A. Method and apparatus for delivering laser energy for ophthalmic use. 4,520,816, Cl. 128-303.100.
Schafer, Rolf; Vogelhuber, Peter; and Wysk, Hans-Joachim, to Kienzle Apparate GmbH. Needle printer assembly. 4,521,122, Cl. 400-124.000.
Schatz, Friedrich: *See*—
Ziemek, Gerhard; Schatz, Friedrich; and Meyer, Hermann, 4,520,622, Cl. 57-59.000.
Scheggi, Verga A.: *See*—
Sottini, Stefano; Brenci, Massimo; Righini, Giancarlo; Falciai, Riccardo; Russo, Vera; and Scheggi, Verga A., 4,521,070, Cl. 350-96.150.
Scheib, Thomas J.: *See*—
Moss, William H.; and Scheib, Thomas J., 4,521,869, Cl. 364-900.000.
Scheidenhelm, E. Louis: *See*—
Gessel, James M.; Kunz, Gary L.; and Scheidenhelm, E. Louis, 4,520,620, Cl. 56-400.000.
Scheinpflug, Hans: *See*—
Maurer, Fritz; Brandes, Wilhelm; Kuck, Karl-Heinz; Reinecke, Paul; and Scheinpflug, Hans, 4,521,420, Cl. 514-259.000.
Schellen, Johannes A. T.: *See*—
Jacobs, Cornelis A. J.; Schellen, Johannes A. T.; and Van Der Vleuten, Anthonius P., 4,521,716, Cl. 313-594.000.
Schenk, Jurgen: *See*—
Dudeck, Ingo; and Schenk, Jurgen, 4,521,769, Cl. 340-635.000.
Schertler, Siegfried. Metering valve. 4,520,993, Cl. 251-57.000.
Scheurer, Roger J.: *See*—
Peterson, Richard L.; Scheurer, Roger J.; and Steinberg, Richard W., 4,520,876, Cl. 172-427.000.
Schiel, Christian; Zurn, Georg; and Schmid, Karl, to J.M. Voith GmbH. Drying cylinder adapted to be heated with steam. 4,520,578, Cl. 34-110.000.
Schimmel, Paul R.: *See*—
Benkovic, Stephen J.; Putney, Scott D.; and Schimmel, Paul R., 4,521,509, Cl. 435-6.000.
Schingnitz, Manfred: *See*—
Kretschmer, Horst; Tietze, Guenter; Noack, Juergen; Schweigel, Hans-Joachim; Schingnitz, Manfred; Werner, Klaus; and Kirsch, Bernd, 4,521,139, Cl. 406-19.000.
Schleppnik, Alfred A.: *See*—
Tou, Jacob S.; and Schleppnik, Alfred A., 4,521,344, Cl. 260-465.00D.
Schloemann, Ernst F. R. A., to Raytheon Company. Tuned resonant circuit utilizing a ferromagnetically coupled interstage line. 4,521,753, Cl. 333-204.000.
Schlumberger Technology Corp.: *See*—
Coblentz, Andrea; Lefevre, Didier; Colombani, Pascal; and Meunier, Denis, 4,520,666, Cl. 73-155.000.
Schmalz, Richard J.: *See*—
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Schmeckenbecher, Arnold F.: *See*—
Arnold, Anthony F.; and Schmeckenbecher, Arnold F., 4,521,449, Cl. 427-96.000.
Schmid, Hartmut, to Glenayre Electronics, Ltd. Coupler mount assembly. 4,520,662, Cl. 73-129.000.
Schmid, Karl: *See*—
Schiel, Christian; Zurn, Georg; and Schmid, Karl, 4,520,578, Cl. 34-110.000.
Schmid, Karlheinz, to Gerbrueder Heller Maschinenfabrik GmbH. Crankshaft milling apparatus. 4,521,143, Cl. 409-200.000.
Schmidt, Glenn H. Golf iron face. 4,521,022, Cl. 273-175.000.
Schmidt, Karl-Heinz: *See*—
Grebe, Reiner; Norbisrath, Max; and Schmidt, Karl-Heinz, 4,520,963, Cl. 241-30.000.
Schmidt, Richard A.; and Tanagho, Emil A., to University of California, The Regents of the. Growing of long-term biological tissue correction structures in vivo. 4,520,821, Cl. 128-334.00R.
Schmitt, Hans-Georg; Reinecke, Paul; Paulus, Wilfried; Genth, Hermann; and Radt, Walter, to Bayer Aktiengesellschaft. Pesticidal iodopropargylammonium salts. 4,521,412, Cl. 514-244.000.
Schmitz, Hermann: *See*—
Engelhardt, Friedrich; Schmitz, Hermann; Gulden, Walter; and Hax, Jorg, 4,521,579, Cl. 526-287.000.
Schnee, Reiner; and Masanek, Jurgen, to Rohm GmbH. Process for making an emulsion polymer. 4,521,552, Cl. 523-313.000.
Schnegg, Julius R., to Burlington Industries, Inc. Woven-like warp knit fabric with tension control for top effect yarn. 4,520,636, Cl. 66-192.000.
Schneider, Linda G.: *See*—
Kessick, Michael A.; George, Zacharia M.; and Schneider, Linda G., 4,521,382, Cl. 423-68.000.
Kessick, Michael A.; George, Zacharia M.; and Schneider, Linda G., 4,521,383, Cl. 423-68.000.
Schneider, Martin V.: *See*—
Carlson, Eric R.; and Schneider, Martin V., 4,521,755, Cl. 333-244.000.
Schoenleber, Donald W.: *See*—
Jones, John H.; and Schoenleber, Donald W., 4,520,958, Cl. 229-72.000.
Schoofs, Mark J. Swim fin for breaststroke swimmers. 4,521,220, Cl. 441-64.000.
Schoonmade, Wim, to Gusto Engineering B.V. Elevating device for an artificial island or work platform. 4,521,134, Cl. 405-198.000.
Schreiber, William L.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,521,634, Cl. 568-665.000.
Schroeder, Thaddeus: *See*—
Ryan, William P.; and Schroeder, Thaddeus, 4,520,658, Cl. 73-117.300.
Schroer, Walter; and Wlasitsch, Gyula, to Bayer Aktiengesellschaft; and Graboplast. Coated composite material for lining passages. 4,521,465, Cl. 428-35.000.
Schuh, Gerald J. Tree brace system. 4,520,590, Cl. 47-43.000.
Schulte in den Baumen, Joachim, to Carl-Zeiss-Stiftung. Cooled field optical system for infrared telescopes. 4,521,068, Cl. 350-1.100.
Schultz, William J.: *See*—
Pocius, Alphonsus V.; and Schultz, William J., 4,521,490, Cl. 428-416.000.
Schulz, Wilhelm. Connector for heated pipes. 4,521,039, Cl. 285-41.000.
Schulze, Dwain C., Jr.: *See*—
Englund, Michael S.; Hafele, Joseph C.; and Schulze, Dwain C., Jr., 4,520,652, Cl. 73-23.000.
Schumann, Henning; Busch, Peter; Fischer, Detlef; and Thiele, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Plastic hairdressing comb. 4,520,831, Cl. 132-11.00R.
Schwab, Manfred: *See*—
Eschrich, Gerhard; and Schwab, Manfred, 4,520,694, Cl. 74-858.000.
Schwartz, Albert B.: *See*—
Rosinski, Edward J.; and Schwartz, Albert B., 4,521,298, Cl. 208-120.000.
Schwarzkopf, Anton. Amusement ride. 4,520,732, Cl. 104-53.000.
Schwefel, Ernst, to Dr. Johannes Heidenhain GmbH. Numerical control device. 4,521,845, Cl. 364-171.000.
Schwehr, Richard A.: *See*—
Liljequist, Lawrence A.; Wible, John E.; and Schwehr, Richard A., 4,520,986, Cl. 248-585.000.
Schweigel, Hans-Joachim: *See*—
Kretschmer, Horst; Tietze, Guenter; Noack, Juergen; Schweigel, Hans-Joachim; Schingnitz, Manfred; Werner, Klaus; and Kirsch, Bernd, 4,521,139, Cl. 406-19.000.
Schwendemann, Volker: *See*—
Plath, Peter; Rohr, Wolfgang; Schwendemann, Volker; and Wuerzer, Bruno, 4,521,604, Cl. 548-301.000.
Schwenzer, Alfred F.: *See*—
Voltmer, Helmut; Schwenzer, Alfred F.; and Spano, John D., 4,521,271, Cl. 156-568.000.
Schwerdt, Friedrich W.: *See*—
Bahrle, Dieter K.; and Schwerdt, Friedrich W., 4,521,280, Cl. 204-15.000.
Scinta, James; and Classen, Theodore M. Oil recovery. 4,521,293, Cl. 208-11.0LE.
SCM Corporation: *See*—
Hahn, Kenneth G., Jr., 4,521,495, Cl. 428-537.100.
Scondo, Ludwig: *See*—
Hampel, Hans-Joachim; Scondo, Ludwig; Stahl, Jurgen; Wegner, Wilhelm; and Bonne, Harry, 4,520,948, Cl. 222-103.000.
Scott, William A.; and Smith, Roger N., to Walbro Corporation. Fuel shut-off valve for internal combustion engines. 4,520,772, Cl. 123-198.0DB.
Scott, William L.: *See*—
Di Martini, Carl R.; Howe, Herbert E.; Scott, William L.; and Bulvanoski, Leo J., 4,521,247, Cl. 75-77.000.
Secretary of State of Social Services in Her Britannic Majesty's Government of the United Kingdon of Great Brtian and Northern Ireland, The: *See*—
Russell, Roy R. B., 4,521,513, Cl. 435-68.000.
Seibert, Karl; Neumann, Klaus; Spiess, Ernst; and Bruil, Hendrik G., to Akzona Incorporated. Thickening agent based on polyether derivatives. 4,521,326, Cl. 252-174.210.
Seiken Kai Foundation Juridical Person: *See*—
Hata, Kosei, 4,521,515, Cl. 435-248.000.
Seisakusho Kabushiki Kaisha Toyoda Jidoshokki: *See*—
Suzuki, Hajime; and Iwano, Yoshimi, 4,520,849, Cl. 139-116.000.
Seitz, David M.; and Weinstein, Richard, to Champion Spark Plug Company. Protective housing for coating applicator. 4,520,949, Cl. 222-108.000.
Seitz, Max: *See*—
Blum, Rainer; Seitz, Max; and Kaczinski, Friedrich, 4,521,555, Cl. 524-63.000.
Semi-Bulk Systems, Inc.: *See*—
Handleman, Avrom R., 4,521,165, Cl. 417-393.000.

Senga, Takao: *See*—
Suzuki, Shigeyoshi; Yamada, Jun; Senga, Takao; Kuriu, Sadao; Yamasaki, Masahiro; Hirose, Iwao; and Maegawa, Tokubee, 4,521,101, Cl. 355-10.000.

Serono Pharmaceutical Partners: *See*—
Pelham, Russell W.; Redden, Charlotte S.; Eshkol, Aliza; and Stiles, Gerald E., 4,521,407, Cl. 424-95.000.

Seto, Haruo: *See*—
Otake, Noboru; Seto, Haruo; Sasaki, Tetsuo; Sugita, Masanori; Natori, Yohei; and Sueda, Noriyoshi, 4,521,339, Cl. 260-239.30B.

Sevastyanov, Viktor V.; Furman, Yakov A.; Grebenschikov, Anatoly P.; Lysov, Viktor F.; and Shalnov, Boris N., to Mezhkhozyai Stvennoe Opytnokonstruktorskoe Bjuro Mariiskogo Respublican-skogo Proizvodstvennogo Obiedinenia "Mariiskmezhkhozkom-bikorm"; and Mariisky Politekhnichesky Institut. Method for growth promotion in animals. 4,520,826, Cl. 128-422.000.

Seven Towns Limited: *See*—
Slade, Brian P., 4,521,024, Cl. 273-271.000.

Severance, Wayne S., Jr.; and Rogers, George T., to Union Carbide Corporation. Plasma arc torch. 4,521,666, Cl. 217-121.0PY.

Sfredda, Albert P. High ratio drive. 4,520,693, Cl. 74-804.000.

Sgourakes, George E.: *See*—
Koziol, Stanislaw; and Sgourakes, George E., 4,520,678, Cl. 73-861.240.

Shalnov, Boris N.: *See*—
Sevastyanov, Viktor V.; Furman, Yakov A.; Grebenschikov, Anatoly P.; Lysov, Viktor F.; and Shalnov, Boris N., 4,520,826, Cl. 128-422.000.

Sharlow, Gary R.: *See*—
Niese, Leo J.; and Sharlow, Gary R., 4,520,853, Cl. 141-168.000.

Sharp Kabushiki Kaisha: *See*—
Funada, Fumiaki; and Shimizu, Keiichiro, 4,521,080, Cl. 350-341.000.
Oka, Takashi, 4,520,583, Cl. 40-378.000.

Shedigian, Vandos; and Voyles, Gerald A., to Emhart Industries, Inc. Dielectric fluid for a compacitor. 4,521,826, Cl. 361-314.000.

Sheffer, Ralph L., to Adams Rite Products, Inc. Slow-closing valve mechanism. 4,520,992, Cl. 251-48.000.

Shell California Production Inc.: *See*—
Samish, Norman C.; and Pohlenz, Jack B., 4,521,388, Cl. 423-235.000.

Shell Offshore Inc.: *See*—
Nandlal, Samlal, 4,521,131, Cl. 405-116.000.

Shell Oil Company: *See*—
Harris, Martin, 4,521,536, Cl. 514-226.000.
van Kessel, Matheus M., 4,520,737, Cl. 110-171.000.
Wattimena, Freddy; and Heijmen, Hendricus J., 4,521,630, Cl. 568-435.000.

Shelly, William A.: *See*—
Trubisky, Leonard G.; and Shelly, William A., 4,521,851, Cl. 364-200.000.
Wilhite, John E.; Shelly, William A.; and Ryan, Charles P., 4,521,850, Cl. 364-200.000.

Shibata, Kiyoshi: *See*—
Motomura, Minoru; Shibata, Kiyoshi; Watanabe, Toshio; and Ohata, Yousuke, 4,521,102, Cl. 355-14.0CU.

Shiber, Samuel: *See*—
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Shibuya, Takashi: *See*—
Miyake, Toshio; Sakai, Shuzo; and Shibuya, Takashi, 4,521,252, Cl. 127-46.300.

Shichijo, Yoshiaki: *See*—
Inukai, Yuzo; and Shichijo, Yoshiaki, 4,520,755, Cl. 118-629.000.

Shields, Harper; and Lineberry, Roger D., to Kayser-Roth Hosiery, Inc. Cushion foot sock. 4,520,635, Cl. 66-185.000.

Shilling, Norman Z., to General Electric Environmental Services, Inc. High capacity gas filter system. 4,521,231, Cl. 55-302.000.

Shimamoto, Hiroshi, to Namiki Precision Jewel Co., Ltd. Reproducing stylus and method of making same. 4,521,877, Cl. 369-173.000.

Shimazaki, Kenji: *See*—
Ogawa, Hiroyasu; Izumi, Kazuo; and Shimazaki, Kenji, 4,520,623, Cl. 57-236.000.

Shimizu, Keiichiro: *See*—
Funada, Fumiaki; and Shimizu, Keiichiro, 4,521,080, Cl. 350-341.000.

Shimonosono, Hitoshi; Ogawa, Naoki; and Hirano, Yoshinori, to Nissan Motor Co., Ltd. Cylinder block of internal combustion engine. 4,520,768, Cl. 123-41.440.

Shin-Etsu Polymer Co., Ltd.: *See*—
Sado, Ryoichi; and Tahara, Kazutoki, 4,520,562, Cl. 29-878.000.

Shinagawa, Susumu: *See*—
Harada, Setsuo; Shinagawa, Susumu; and Kitano, Kazuaki, 4,521,340, Cl. 260-245.20T.
Kanamaru, Tsuneo; Shinagawa, Susumu; and Asai, Mitsuko, 4,521,432, Cl. 514-556.000.

Shingu, Tadashi; Tsutada, Tadakazu; Nishihara, Toshio; and Suzuki, Nobuo, to Teijin Limited. Structure of multilayered unit for windows. 4,520,611, Cl. 52-789.000.

Shinko Electric Co., Ltd.: *See*—
Abe, Eiji; and Kanazawa, Junpei, 4,520,889, Cl. 180-168.000.

Shinohara, Hirofumi; Tomisawa, Osamu; Anami, Kenji; and Yoshimoto, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Differential amplifying circuit. 4,521,704, Cl. 307-530.000.

Shinomiya, Hiroaki; and Noguchi, Minetoshi, to Tokyo Juki Industrial Co., Ltd. Seam forming method and device for sewing machine for embroidery. 4,520,745, Cl. 112-266.100.

Shinsei, Kiyoichi: *See*—
Kiyota, Yuhiko; Tsuji, Katsuyuki; Kume, Satoru; Takada, Hiroaki; Shinsei, Kiyoichi; Matsumoto, Akio; and Ogawa, Hitoshi, 4,520,624, Cl. 60-286.000.

Shpigelman, David. Dispensing device for cylindrical bodies, such as rolls of toilet paper, paper towels and the like. 4,520,968, Cl. 242-55.300.

Shudo, Hirokazu: *See*—
Harigane, Kotaro; Tando, Shuichi; Takahashi, Kenichi; and Shudo, Hirokazu, 4,520,557, Cl. 29-740.000.

Shufflebarger, William S.: *See*—
Sucro, Jost S.; Moyer, Ted A.; and Shufflebarger, William S., 4,520,689, Cl. 74-595.000.

Shulman, Carl, to MSI Electronics Inc. Mercury probes. 4,521,730, Cl. 324-158.00F.

Siano, Donald B.: *See*—
Turner, S. Richard; Siano, Donald B.; and Bock, Jan, 4,521,580, Cl. 526-307.200.

Sielaff, Gunter: *See*—
Lundstrom, Kurt I.; Arwin, Hans R.; Rieke, Erwin; Sielaff, Gunter; and Hennrich, Norbert, 4,521,522, Cl. 436-525.000.

Siemens Aktiengesellschaft: *See*—
Boehmer, Georg, 4,521,123, Cl. 400-124.000.
Daar, Horst; and Alig, Franz, 4,521,223, Cl. 55-13.000.
Daar, Horst; and Alig, Franz, 4,521,228, Cl. 55-105.000.
Finkenzeller, Johann; and Mittelstaedt, Wolfgang, 4,521,899, Cl. 378-40.000.
Leenhouts, Frans; and Kruger, Hans, 4,521,079, Cl. 350-339.00R.
Riha, Gerd; and Veith, Richard, 4,521,751, Cl. 333-151.000.
Sachs, Bertram, 4,521,667, Cl. 219-121.0LJ.
Wessely, Herrmann, 4,521,829, Cl. 361-387.000.
Ziegler, Horst, 4,520,675, Cl. 73-718.000.

Sigma Ltd.: *See*—
Ireland, Eric, 4,520,569, Cl. 33-148.00E.

Signode Corporation: *See*—
Urban, Clement A.; and Huson, Gale W., 4,520,720, Cl. 100-26.000.

Sikora, Joseph G. Mechanical-emergency system between vehicle service brake foot pedal and parking brake. 4,520,907, Cl. 188-156.000.

Sikorski, Charles F., to FMC Corporation. Oil well completion fluid. 4,521,316, Cl. 252-8.55R.

Silcox, William H., to Chevron Research Company. Pressurized gas filled tendons. 4,521,135, Cl. 405-224.000.

Sillivent, Bob; and Sillivent, Clifford, to Wright, Thomas J.; and Burns, Mike L. Conveyor belt cleaning methods and apparatuses therefor. 4,520,917, Cl. 198-499.000.

Sillivent, Clifford: *See*—
Sillivent, Bob; and Sillivent, Clifford, 4,520,917, Cl. 198-499.000.

Silman, Robert E., to AMB Systems Corp. Microorganism identification technique. 4,521,512, Cl. 435-35.000.

Simard, Albert J.: *See*—
Blank, Richard W.; and Simard, Albert J., 4,521,120, Cl. 374-102.000.

Simard, Julien, to Hydro-Quebec. Current transformer protection device. 4,521,822, Cl. 361-35.000.

Simm, Walter: *See*—
Podszun, Wolfgang; Simm, Walter; Goossens, John; and Suling, Carlhans, 4,521,505, Cl. 430-112.000.

Simms, Douglas P.; and Dobbs, Joseph M., to Mississippi Chemical Corporation. Coating agent for particulate materials. 4,521,239, Cl. 71-27.000.

Simon, Gilbert I.; and Witkin, Roy T. Chemotherapeutic method for treating periodontal disease. 4,521,403, Cl. 424-51.000.

Simpson, Daniel G.: *See*—
Canada, Ronald G.; Piety, Kenneth R.; Simpson, Daniel G.; and Pardue, E. Forrest, 4,520,674, Cl. 73-660.000.

Simpson, Harold G.; and Neyer, Leo E., to Encon Products, Inc. Method for installing a roof system positionable over an existing roof structure. 4,520,610, Cl. 52-745.000.

Sindoris, Arthur R.: *See*—
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Singer Company, The: *See*—
Barthel, Richard C.; and Roy, Richard D., 4,521,722, Cl. 318-578.000.
Hicks, Irwin A.; and Albrecht, Charles W., 4,520,676, Cl. 73-281.000.
Zylbert, Thaddeus J., 4,520,743, Cl. 112-255.000.

Siol, Werner: *See*—
Arndt, Peter J.; Ludwig, Walter; Munzer, Manfred; Siol, Werner; and Wenzel, Franz, 4,521,567, Cl. 525-261.000.

Sircar, Ila; and Bristol, James A., to Warner-Lambert Company. 4,5-Dihydro-6-[(substituted)-1H-imidazol-4-yl or 5-yl]-3(2H)-pyridazinones and 6-[(substituted)-1H-imidazol-4-yl or 5-yl]-3(2H)-pyridazinones. 4,521,416, Cl. 514-252.000.

Sitrick, David H. Video game including user visual image. 4,521,014, Cl. 273-1.0GC.

Sitrin, Robert D.: *See*—
Chan, George W.; and Sitrin, Robert D., 4,521,335, Cl. 260-112.50R.

Sitter, Erhard, to Robert Bosch GmbH. Fuel injection apparatus with pilot injection and main injection in internal combustion engines. 4,520,774, Cl. 123-300.000.

Siuta, Vincent P.; and Slutsky, Joel, to Du Pont de Nemours, E. I., and Company. Copper conductor compositions. 4,521,329, Cl. 252-512.000.

SKF Industrial Trading and Development Co., B.V.: *See*—
van Nederveen, Hans B., 4,520,882, Cl. 175-410.000.

Skovdal, Jorgen, to Clairol Incorporated. Vapor generating hair roller assembly. 4,520,832, Cl. 132-33.00R.

Skripek, Milan R.: *See*—
Kelley, Arnold E.; Block, Michael J.; and Skripek, Milan R., 4,521,278, Cl. 201-17.000.

Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, to Upjohn Company, The. Process for the preparation of 1,3-oxazine-4-ones. 4,521,599, Cl. 544-97.000.

Slade, Brian P., to Seven Towns Limited. Apparatus for playing a game. 4,521,024, Cl. 273-271.000.

Slaminski, J. Michael, to Slaminski, J. Michael; and Haefliger, William W., a part interest. Lightweight solar collector. 4,520,796, Cl. 126-445.000.

Slinsky, Albert. Drill bit sharpener. 4,520,599, Cl. 51-219.00R.

Slutsky, Joel: *See*—
Siuta, Vincent P.; and Slutsky, Joel, 4,521,329, Cl. 252-512.000.

Slyker, Richard W.; and Pettit, John R., to Vetco Offshort, Inc. Combined metal and elastomer seal. 4,521,040, Cl. 285-140.000.

Smit, Ian D.: *See*—
de Greef, Magdel N.; and Smit, Ian D., 4,520,809, Cl. 128-200.240.

Smith, David R.; and Herron, Maynard M., to Hesston Corporation. Spring cushion chisel plow shank assembly. 4,520,878, Cl. 172-705.000.

Smith, Duaine W.: *See*—
Wyland, Alvin D.; Smith, Duaine W.; and Blackburn, Louis W., 4,521,658, Cl. 219-10.55B.

Smith, Edward F., III: *See*—
Butt, Sheldon H.; Smith, Edward F., III; and Gyurina, F. Dennis, 4,521,469, Cl. 428-35.000.

Smith, Gordon H.: *See*—
Baker, William; Smith, Gordon H.; Beach, Xio I.; Sallee, Gary F.; and Stein, Jeffrey I., 4,521,915, Cl. 455-165.000.

Smith, Herman W.: *See*—
Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, 4,521,599, Cl. 544-97.000.

Smith Kline & French Laboratories Limited: *See*—
Brown, Thomas H.; and Durant, Graham J., 4,521,418, Cl. 514-272.000.
Brown, Thomas H.; and Young, Rodney C., 4,521,625, Cl. 564-461.000.

Smith, Robert J.: *See*—
Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, 4,521,599, Cl. 544-97.000.

Smith, Roger N.: *See*—
Scott, William A.; and Smith, Roger N., 4,520,772, Cl. 123-198.0DB.

SmithKline Beckman Corporation: *See*—
Chan, George W.; and Sitrin, Robert D., 4,521,335, Cl. 260-112.50R.
Rossignol, Jean F., 4,521,424, Cl. 514-314.000.

SmithKline Diagnostics, Inc.: *See*—
Jacke, Stanley E., 4,521,520, Cl. 436-66.000.

Smiths Industries Public Limited Company: *See*—
Masom, Ronald A., 4,521,088, Cl. 350-582.000.

Smoot, George W.; and Macnak, Philip P., to Motorola, Inc. Radio paging device including apparatus for preventing undesired device turn-off. 4,521,776, Cl. 340-825.440.

SMW Schneider & Weisshaupt GmbH: *See*—
Hiestand, Karl, 4,521,028, Cl. 279-1.00C.

Smythe, Kenneth R., to Sale Tilney Technology Plc. Rotary atomizer for coating workpieces with a fine layer of liquid material, and a method of operating the said atomizer. 4,521,462, Cl. 427-421.000.

Snape, Colin E.: *See*—
Clarke, James W.; Kimber, Geoffrey M.; Rantell, Terry D.; and Snape, Colin E., 4,521,291, Cl. 208-8.0LE.

Snell, Richard G.; and Loughridge, Fredrick A., to GTE Products Corporation. Solder glass and electrical device employing the same. 4,521,641, Cl. 174-50.640.

Snow, John P., to Lubriquip-Houdaille, Inc. Lubricant applying system and injector means. 4,520,902, Cl. 184-7.400.

Sobolewski, Robert; and Eberle, David N., to Republic Steel Corporation. Method and apparatus for alloying continuously cast steel products. 4,520,861, Cl. 164-473.000.

Societe Anonyme Dite: Etablissements Tourtellier S.A.: *See*—
Willmann, Claude, 4,520,733, Cl. 104-93.000.

Societe Anonyme dite: Etudes et Fabrications Optiques: *See*—
Otto, Maurice J.; and Peridont, Jean-Pierre, 4,520,596, Cl. 51-55.000.

Societe anonyme dite: Prestinox S.A.: *See*—
Oury, Jean-Claude, 4,521,673, Cl. 219-230.000.

Societe d'Exploitation des Machines Dubuit: *See*—
Rouly, Eric; Baquet, Philippe; and Dubuit, Jean-Louis, 4,520,726, Cl. 101-123.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Bouiller, Jean G.; and Soligny, Marcel R., 4,521.160, Cl. 416-218.000.

Societe Nationale Elf Aquitaine: *See*—
Belouet, Christian, 4,520,752, Cl. 118-405.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Cordier, Bernard; and Berge, Christian, 4,520,665, Cl. 73-155.000.
Detienne, Jean-Louis; Levesque, Guy; and Tozzolino, Pierre, 4,521,3G1, Cl. 209-166.000.

Solaroli, Sergio, to Finike Italiana Marposs S.p.A. Gauge for checking the clearance existing between the cams of a camshaft and the relevant valves. 4,521,863, Cl. 364-561.000.

Soligny, Marcel R.: *See*—
Bouiller, Jean G.; and Soligny, Marcel R., 4,521,160, Cl. 416-218.000.

Solin, Stuart A.: *See*—
Schachar, Ronald A.; and Solin, Stuart A., 4,520,816, Cl. 128-303.100.

Solloway, Daniel S. Hand engageable aquatic exercise assembly. 4,521,011, Cl. 272-116.000.

Solomon, Donald D.; McGary, Charles W.; and Pascarella, Vincent J., to Warner-Lambert Company. Covalent bonded antithrombogenic polyurethane material. 4,521,564, Cl. 525-54.100.

Somezawa, Masashi: *See*—
Ninomiya, Yoshinobu; Somezawa, Masashi; and Hashimoto, Akira, 4,521,486, Cl. 428-407.000.

Sommer, Werner, to T+F Kunststuffe fur Tecknik und Freizeit GmbH. Aqueous plastic molding compositions based on ceramic raw materials containing air-drying and sinterable additives. 4,521,361, Cl. 264-126.000.

Son Su Kung: *See*—
Hsie, C. H., 4,521,529, Cl. 502-217.000.

Sondhaus, Charles A., to Sondhaus, Charles A. Method of and device for irradiating animals. 4,521,690, Cl. 250-455.100.

Sony Corporation: *See*—
Akagiri, Kenzo; and Katakura, Masayuki, 4,521,738, Cl. 330-134.000.
Guisinger, Barrett E., 4,521,818, Cl. 360-65.000.
Ikeda, Yasunari, 4,521,802, Cl. 358-11.000.
Ninomiya, Yoshinobu; Somezawa, Masashi; and Hashimoto, Akira, 4,521,486, Cl. 428-407.000.
Yamada, Takaaki; Tsuda, Yukio; and Yamakoshi, Akira, 4,521,744, Cl. 331-1.00A.

Soos, Rudolf; Kolta, Rezso; Zoltan, Sandor; and Tary, Maria, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Process for the separation of esters. 4,521,612, Cl. 560-124.000.

Sorensen, Wayne E.; and Johnson, Larry E., to Herschel Corporation. Cutter Guard. 4,520,618, Cl. 56-310.000.

Sottini, Stefano; Brenci, Massimo; Righini, Giancarlo; Falciai, Riccardo; Russo, Vera; and Scheggi, Verga A., to Consiglio Nazionale Delle Ricerche. High power laser radiation conveying device utilizing variable section fiber optics. 4,521,070, Cl. 350-96.150.

Souma, Masahiro: *See*—
Momono, Masakichi; Moriya, Hisanori; Souma, Masahiro; and Hamashima, Eiji, 4,520,962, Cl. 239-585.000.

Southgate, Robert; and Brown, Pamela, to Beecham Group p.l.c. Oxazine resolution process. 4,521,337, Cl. 534-560.000.

Sovonics Solar Systems: *See*—
Ovshinsky, Stanford R.; Hudgens, Stephen J.; and Kastner, Marc A., 4,521,447, Cl. 427-45.100.

Spalding & Evenflo Companies, Inc.: *See*—
Cone, Richard E., 4,521,052, Cl. 297-3.000.

Spano, John D.: *See*—
Voltmer, Helmut; Schwenzer, Alfred F.; and Spano, John D., 4,521,271, Cl. 156-568.000.

Spars, Byron G.; Klett, Robert J.; and Wallman, P. Henrik, to Chevron Research Company. Process for improving quality of pyrolysis oil from oil shales and tar sands. 4,521,292, Cl. 208-11.00R.

Spataro, Mario: *See*—
Galli, Paolo; and Spataro, Mario, 4,521,566, Cl. 525-247.000.

Speckhart, Max, to BOSCH-SIEMENS HAUSGERAETE GmbH. Electromotively driven household slicing machine for food. 4,520,703, Cl. 83-478.000.

Spector, Donald. Sound tape player having an animated character. 4,521,205, Cl. 446-302.000.

Spector, George: *See*—
Yogi, Seigi; and Spector, George, 4,520,525, Cl. 15-104.920.

Speed-O-Print Business Machines Corp.: *See*—
Samuels, Abe; Yamashita, Keitaro; and Sasaki, Yoshitaka, 4,521,184, Cl. 432-60.000.

Spencer, Harvey J.: *See*—
Ecker, Harold; and Spencer, Harvey J., 4,520,728, Cl. 101-248.000.

Sperry Corporation: *See*—
DeCoene, Frans J. G. C., 4,520,721, Cl. 100-88.000.

Spiess, Ernst: *See*—
Seibert, Karl; Neumann, Klaus; Spiess, Ernst; and Bruil, Hendrik G., 4,521,326, Cl. 252-174.210.

Spilhaus, Athelstan. Geographical sundial. 4,520,572, Cl. 33-270.000.

Spiller, Peter O.: *See*—
Holroyd, Ralph; and Spiller, Peter O., 4,520,782, Cl. 123-450.000.

Spitzer, Wayne A.: *See*—
Spry, Douglas O.; and Spitzer, Wayne A., 4,521,598, Cl. 544-16.000.

Spivack, John D.; and Pastor, Stephen D., to Ciba Geigy Corporation. Thiocarbamate stabilizers. 4,521,320, Cl. 252-47.500.

Sposini, Maurizio: *See*—
Gabrielli, Luciano; and Sposini, Maurizio, 4,521,882, Cl. 370-85.000.

Spry, Douglas O.; and Spitzer, Wayne A., to Eli Lilly and Company. 3-Azidocephalosporins. 4,521,598, Cl. 544-16.000.

Spykerman, Scott A.: *See*—
Cody, Michael J.; and Spykerman, Scott A., 4,521,051, Cl. 296-97.00H.

Squire, William: *See*—
Whitley, George J.; Rayl, Martin; and Squire, William, 4,520,549, Cl. 29-566.300.
Stacey, Albert B., Jr., to United States of America, National Aeronautics & Space Administration. Mechanical fastener. 4,520,601, Cl. 52-127.700.
Stahl, Alan L.: *See*—
Phelps, Weldon L.; and Stahl, Alan L., 4,521,856, Cl. 364-426.000.
Stahl, Jurgen: *See*—
Hampel, Hans-Joachim; Scondo, Ludwig; Stahl, Jurgen; Wegner, Wilhelm; and Bonne, Harry, 4,520,948, Cl. 222-103.000.
Stahlkonstruktionen Suckow & Fischer: *See*—
Suckow, Klaus, 4,520,607, Cl. 52-489.000.
Stahlkopf, Friedrich R. R., to O.T. Pumpen GmbH & Co. KG. Oscillating displacement pump. 4,521,163, Cl. 417-238.000.
Stahly, G. Patrick, to Ethyl Corporation. Aromatic coupling process. 4,521,345, Cl. 260-465.00F.
Stalder, Herbert; and Briner, Emil, to Rieter Machine Works Limited. Drafting mechanism for spinning machines. 4,520,532, Cl. 19-244.000.
Stam, John G.: *See*—
Hamanaka, Ernest S.; and Stam, John G., 4,521,533, Cl. 514-80.000.
Stamps, Kenneth H.: *See*—
Bohrer, Walter G., Jr.; and Stamps, Kenneth H., 4,520,717, Cl. 99-337.000.
Standard Oil Company, The: *See*—
Li, George S., 4,521,224, Cl. 55-16.000.
Standard Oil Company (Indiana): *See*—
Howe, Arthur T., 4,521,800, Cl. 357-67.000.
Standex International Corporation: *See*—
Kowalski, Frank P., 4,520,800, Cl. 128-72.000.
Stang, John H.: *See*—
Reichenbach, Dean H.; Stang, John H.; Cummings, Lewis W.; Glasson, Richard E.; and Ruthmansdorfer, David A., 4,520,627, Cl. 60-599.000.
Stanojevic, Silvo: *See*—
Atherton, James H.; and Stanojevic, Silvo, 4,521,727, Cl. 323-294.000.
Stapleford, Gary N.; and Borsa, Andrew J., to Wang Laboratories, Inc. Data communication system with increased effective bandwidth. 4,521,881, Cl. 370-72.000.
Stapley, Edward O., to Merck & Co., Inc. Antibiotics-859A and production thereof. 4,521,408, Cl. 424-115.000.
Stark, Axel: *See*—
Huber, Franz R.; and Stark, Axel, 4,521,913, Cl. 455-121.000.
Stark, Virgil; and Genequand, Pierre, to North American Utility Construction Corporation. Solar energy concentrating slat arrangement and collector. 4,520,794, Cl. 126-438.000.
Stauffer Chemical Company: *See*—
Baker, Don R.; and Tam, Teresa M., 4,521,243, Cl. 71-100.000.
Estes, William E., 4,521,391, Cl. 423-307.000.
LaBauve, Raphael J., 4,520,808, Cl. 128-200.140.
Steele, Robert B.: *See*—
Babbel, John H.; Russell, William A.; and Steele, Robert B., 4,521,870, Cl. 364-900.000.
Steigerwald, Carl J., to Kendall Company, The. Liquid drainage system with hinged cup-shaped valve. 4,521,213, Cl. 604-323.000.
Stein, Jeffrey I.: *See*—
Baker, William; Smith, Gordon H.; Beach, Xio I.; Sallee, Gary F.; and Stein, Jeffrey I., 4,521,915, Cl. 455-165.000.
Steinberg, Richard W.: *See*—
Peterson, Richard L.; Scheurer, Roger J.; and Steinberg, Richard W., 4,520,876, Cl. 172-427.000.
Steiner, Alfred, to Steiner Silidur AG. Building blocks. 4,521,138, Cl. 405-284.000.
Steiner Silidur AG: *See*—
Steiner, Alfred, 4,521,138, Cl. 405-284.000.
Steinhauser, Thomas; and Buch, Thomas, to Honsel-Werke AG. Apparatus for removing gases from molten metal, especially molten aluminum. 4,521,001, Cl. 266-208.000.
Steinheuser, Peter: *See*—
Menezes, Edgar V.; and Steinheuser, Peter, 4,520,822, Cl. 128-335.500.
Stepan Chemical Company: *See*—
Magnus, George, 4,521,611, Cl. 560-91.000.
Stepke, Anthony C.; and Clusener, Gerhard R., to Theta Industries, Inc. Constant load dilatometers. 4,521,119, Cl. 374-56.000.
Stern, Howard R.: *See*—
Saffer, Gary M.; Lambert, Gerard L.; and Stern, Howard R., 4,521,206, Cl. 446-444.000.
Stevens, Frank, to Atlantic Richfield Company. Bis(alpha-alkylbenzyl)ether production. 4,521,635, Cl. 568-659.000.
Stevens, Frank, to Atlantic Richfield Company. Process for the production of bis(alpha-alkylbenzyl) ethers. 4,521,637, Cl. 568-659.000.
Stewart, E. Allen; and Keesling, Evan L., to Amasek, Inc. Method and system for conditioning and removing aquatic plants. 4,520,616, Cl. 56-9.000.
Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Lenhard-Backhaus, Hugo; and Krumpeck, Kurt, 4,521,033, Cl. 280-700.000.
Stig G. Carlqvist Motor Consultant (CMC) AB: *See*—
Carlqvist, Stig G., 4,520,628, Cl. 60-616.000.
Stiles, Gerald E.: *See*—
Pelham, Russell W.; Redden, Charlotte S.; Eshkol, Aliza; and Stiles, Gerald E., 4,521,407, Cl. 424-95.000.
Stockdale, Wendell B.: *See*—
Breuninger, Robert E., 4,520,753, Cl. 118-500.000.
Stoff, William G.: *See*—
Rea, Gerald M.; Stoff, William G.; and Zens, John F., 4,521,050, Cl. 296-192.000.
Stohr, Frank-Michael: *See*—
Beck, Ulrich; Stohr, Frank-Michael; and Nickel, Horst, 4,521,217, Cl. 8-639.000.
Stolzenburg, Rudolf; Bergthaller, Peter; Wolfrum, Gerhard; and Strauss, Jurgen, to Agfa-Gevaert Aktiengesellschaft. Monoazo pyridinol dyes chelated or capable of being chelated with metal ions and their use for image production. 4,521,506, Cl. 430-241.000.
Stone, Spencer A. End elevation adjustment of material separating tables. 4,521,302, Cl. 209-441.000.
Storms, William J., to Du Pont Canada Inc. Pouches of ethylene/octene-1 copolymer film containing a flowable material. 4,521,437, Cl. 426-130.000.
Stoughton, John W.; and Willis, Donald H., to RCA Corporation. Beam current limiting arrangement for a digital television system. 4,521,811, Cl. 358-243.000.
Stout, Robert L., to Enzyme Technology Company. Catalyzed colorimetric and fluorometric substrates for peroxidase enzyme determinations. 4,521,511, Cl. 435-28.000.
Strauss, Jurgen: *See*—
Stolzenburg, Rudolf; Bergthaller, Peter; Wolfrum, Gerhard; and Strauss, Jurgen, 4,521,506, Cl. 430-241.000.
Strong, John C. Self-cleaning furnace filter construction. 4,521,230, Cl. 55-274.000.
Strub, Jean-Claude, to Luk Lamellen und Kupplungsbau GmbH. Multistage clutch disc arrangement with dished clutch disc, friction generating means, and load friction unit. 4,520,915, Cl. 192-106.200.
Strub, Jean-Claude, to Luk Lamellen und Kupplungsbau GmbH. Clutch disc assembly including a flange on the clutch disc, the flange extending through one guide plate and a friction disc. 4,520,916, Cl. 192-106.200.
Stuhler, Herbert; and Krempl, Engelbert, to Hoechst Aktiengesellschaft. Process for the purification of esters. 4,521,595, Cl. 536-127.000.
Sturges, Robert H., Jr.; Birsa, Joseph J.; Dawson, Paul H.; and Byford, Roger G., to Westinghouse Electric Corp. Manipulator control system and apparatus for decontaminating nuclear steam generators. 4,521,844, Cl. 364-167.000.
Sturgill, James D.: *See*—
Appleman, William S.; and Sturgill, James D., 4,521,044, Cl. 294-82.240.
Suckow, Klaus, to Stahlkonstruktionen Suckow & Fischer. Releasable resilient mounting assembly for panel members. 4,520,607, Cl. 52-489.000.
Sucro, Jost S.; Moyer, Ted A.; and Shufflebarger, William S., to General Motors Corporation. Windshield wiper transmission. 4,520,689, Cl. 74-595.000.
Sueda, Noriyoshi: *See*—
Otake, Noboru; Seto, Haruo; Sasaki, Tetsuo; Sugita, Masanori; Natori, Yohei; and Sueda, Noriyoshi, 4,521,339, Cl. 260-239.30B.
Suganuma, Saburo; and Kataoka, Hiroyuki, to Fuji Xerox Co., Ltd. Apparatus for combining information from different forms to generate composite slips. 4,521,096, Cl. 355-3.00R.
Sugherificio P. Careddu S.p.A.: *See*—
Careddu, Franco, 4,521,266, Cl. 156-242.000.
Sugimoto, Tadao; Ikeda, Hideo; Mifune, Hiroyuki; and Nakamura, Koki, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive materials. 4,521,508, Cl. 430-567.000.
Sugimura, Minoru: *See*—
Hirota, Ken; Fujimoto, Yoshiaki; Watanabe, Kouichi; and Sugimura, Minoru, 4,521,323, Cl. 252-62.590.
Sugisawa, Ko; Matsumura, Yasushi; and Taga, Kazumitsu, to House Food Industrial Co., Ltd. Process for drying foods under reduced pressure. 4,520,574, Cl. 34-5.000.
Sugita, Masanori: *See*—
Otake, Noboru; Seto, Haruo; Sasaki, Tetsuo; Sugita, Masanori; Natori, Yohei; and Sueda, Noriyoshi, 4,521,339, Cl. 260-239.30B.
Sugita, Yoshiaki: *See*—
Genma, Hideyuki; and Sugita, Yoshiaki, 4,521,049, Cl. 296-185.000.
Sugitani, Hiroshi: *See*—
Yokota, Masami; Sugitani, Hiroshi; and Inamoto, Tadayoshi, 4,521,787, Cl. 346-140.00R.
Sugiyama, Hiroaki, to Ricoh Company, Ltd. Opening means for powder vessel. 4,520,695, Cl. 81-3.070.
Suissa, Moshe. Cleaning apparatus. 4,520,577, Cl. 34-76.000.
Suling, Carlhans: *See*—
Podszun, Wolfgang; Simm, Walter; Goossens, John; and Suling, Carlhans, 4,521,505, Cl. 430-112.000.
Sulzer Brothers Limited: *See*—
Rohr, Willy; Wollgarten, Kurt; and Vogel, Rudolf, 4,520,851, Cl. 139-448.000.
Sumitomo Chemical Company, Limited: *See*—
Furukawa, Hiroshi; and Saito, Yuichi, 4,521,587, Cl. 526-340.200.
Mitsuno, Tatsuyuki; and Yamamoto, Masashi, 4,521,487, Cl. 428-407.000.
Sumitomo Electric Industries, Ltd.: *See*—
Hayashi, Hideki; and Kikuchi, Kenichi, 4,521,888, Cl. 372-50.000.
Murakami, Kazuhito; and Takahashi, Kenichi, 4,521,073, Cl. 350-96.340.
Sumitomo Light Metal Industries, Ltd.: *See*—
Tanabe, Zenichi; Itoh, Katsuhisa; and Watanabe, Yoshiaki, 4,521,284, Cl. 204-71.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Furukawa, Hiroshi; and Saito, Yuichi, 4,521,587, Cl. 526-340.200.

Sundstrand Corporation: *See—*
Linton, David J., 4,521,060, Cl. 303-71.000.
Supafit Gymnasium Equipment Pty. Ltd.: *See—*
Dofel, Andrew W. R., 4,521,013, Cl. 272-136.000.
Suroff, Leonard W.: *See—*
Kolt, Stanley, 4,520,959, Cl. 236-49.000.
Sutton, Gerald E.: *See—*
Engelke, Claude W.; Sutton, Gerald E.; and Potter, Steven E., 4,521,354, Cl. 264-46.600.
Suzuka, Susumu: *See—*
Okazaki, Hideo; Imagome, Hiroshi; Suzuka, Susumu; and Sakai, Kiyoshi, 4,521,605, Cl. 548-440.000.
Suzuki, Akiyoshi; Sato, Hirosi; Omata, Takashi; and Kosugi, Masao, to Canon Kabushiki Kaisha. Exposure apparatus. 4,521,082, Cl. 350-405.000.
Suzuki, Hajime; and Iwano, Yoshimi, to Seisakusho Kabushiki Kaisha Toyoda Jidoshokki. Method for disposal of defective weft yarn in a fluid jet loom. 4,520,849, Cl. 139-116.000.
Suzuki, Hidetoshi: *See—*
Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; Ozawa, Kunitaka; Koumura, Noboru; and Kazuma, Koji, 4,521,805, Cl. 358-75.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Ishida, Tokuzi; and Aono, Kiyotaka, 4,520,776, Cl. 123-308.000.
Suzuki, Junichiro: *See—*
Yamamoto, Yoshihiro; Suzuki, Junichiro; and Nakamura, Minoru, 4,521,248, Cl. 75-238.000.
Suzuki Motor Company Limited: *See—*
Genma, Hideyuki; and Sugita, Yoshiaki, 4,521,049, Cl. 296-185.000.
Suzuki, Nobuo: *See—*
Shingu, Tadashi; Tsutada, Tadakazu; Nishihara, Toshio; and Suzuki, Nobuo, 4,520,611, Cl. 52-789.000.
Suzuki, Shigeyoshi; Yamada, Jun; Senga, Takao; Kuriu, Sadao; Yamasaki, Masahiro; Hirose, Iwao; and Maegawa, Tokubee, to Mitsubishi Paper Mills, Ltd.; and Dainippon Screen Mfg. Co., Ltd. Liquid developing apparatus for electrophotography. 4,521,101, Cl. 355-10.000.
Suzuki, Shoichi; Ohta, Wataru; Sakurai, Noriaki; and Yamashita, Michio, to Yokohama Rubber Co., Ltd., The. Caisson for underwater structures. 4,521,133, Cl. 405-195.000.
Suzuki, Shun: *See—*
Kimura, Kazuo; Taneda, Yukinori; Tsuyuki, Shinichi; Suzuki, Shun; Hashimoto, Yoshio; and Sakamoto, Shinichi, 4,520,965, Cl. 242-7.05B.
Svenska Sockerfabriks AB: *See—*
Dahmen, Jan E.; Magnusson, Hans G.; and Martensson, Kaj B., 4,521,592, Cl. 536-4.100.
Svenson, Bert N. Centralizer for well casings. 4,520,869, Cl. 166-241.000.
Swaim, Robert J.: *See—*
Buckley, John D.; Swaim, Robert J.; Fox, Robert L.; and Johnston, David F., 4,521,659, Cl. 219-10.770.
Swaniger, James R.; and Goth, Paul R., to American Hospital Supply Corporation. Instrument for ophthalmic laser surgery 4,520,824, Cl. 128-395.000.
Swedish Rail System AB SRS: *See—*
Borup, Alf L.; and Astrom, Erik G., 4,520,901, Cl. 184-3.100.
Swiss Aluminum Ltd.: *See—*
Kesting, Marinus C., 4,521,663, Cl. 219-76.140.
Switzer, Jay A., to Union Oil Company of California. Highly conductive photoelectrochemical electrodes and uses thereof. 4,521,499, Cl. 429-111.000.
Sychev, Anatoly P.: *See—*
Yarygin, Vladimir I.; Sannikov, Jury I.; Panchenko, Anatoly I.; Sychev, Anatoly P.; Vikharev, Ivan G.; Kuur, Vyacheslav P.; and Toguzov, Mels Z., 4,521,245, Cl. 75-21.000.
Synthelabo: *See—*
Kaplan, Jean-Pierre, 4,521,619, Cl. 514-315.000.
Sytek, Incorporated: *See—*
Biba, Kenneth J.; and Picazo, Jose J., Jr., 4,521,891, Cl. 375-8.000.
Szenger, Franz: *See—*
Herzog, Klaus; Szenger, Franz; and Gentner, Gabriele, 4,520,700, Cl. 82-31.000.
Tachibana, Yoshinori: *See—*
Kitajima, Nobuyuki; Tachibana, Yoshinori; Muraki, Asashi; and Kuzuoka, Shinichi, 4,521,355, Cl. 264-60.000.
Tachikawa Spring Co., Ltd.: *See—*
Nishino, Takaichi, 4,520,982, Cl. 248-430.000.
Sakamoto, Takao; and Abe, Tadafumi, 4,521,473, Cl. 428-82.000.
Taga, Kazumitsu: *See—*
Sugisawa, Ko; Matsumura, Yasushi; and Taga, Kazumitsu, 4,520,574, Cl. 34-5.000.
Tagami, Katsutoshi: *See—*
Nakamura, Yukinobu; Tagami, Katsutoshi; and Takahashi, Tsuneo, 4,521,777, Cl. 340-995.000.
Tahara, Kazutoki: *See—*
Sado, Ryoichi; and Tahara, Kazutoki, 4,520,562, Cl. 29-878.000.
Tahim, Raghbir S.; Hayashibara, George M.; and Chang, Kai, to TRW Inc. Suspended stripline varactor-tuned Gunn oscillator. 4,521,747, Cl. 331-107.0SL.
Takada, Hiroaki: *See—*
Kiyota, Yuhiko; Tsuji, Katsuyuki; Kume, Satoru; Takada, Hiroaki; Shinsei, Kiyoichi; Matsumoto, Akio; and Ogawa, Hitoshi, 4,520,624, Cl. 60-286.000.
Takada, Juichiro, to Takata Corporation. Lockable moving belt anchor for passive vehicle occupant restraint belt systems. 4,521,034, Cl. 280-804.000.
Takada, Yusaku: *See—*
Katayama, Hajime; Nitanda, Hiroshi; Nagaoka, Tateki; Kishi, Hirotoshi; Takada, Yusaku; Iida, Noriyoshi; Inuzuka, Tsuneki; and Komiya, Yutaka, 4,521,099, Cl. 355-8.000.
Takahashi, Kenichi: *See—*
Harigane, Kotaro; Tando, Shuichi; Takahashi, Kenichi; and Shudo, Hirokazu, 4,520,557, Cl. 29-740.000.
Murakami, Kazuhito; and Takahashi, Kenichi, 4,521,073, Cl. 350-96.340.
Takahashi, Kihei; and Sassa, Yusei, to Yoshida Kogyo K. K. Apparatus for pairing two rows of slide fastener zigzag coupling elements. 4,520,559, Cl. 29-766.000.
Takahashi, Kotei, to Nissan Motor Co., Ltd. Shift control mechanism of an automotive manual transmission. 4,520,685, Cl. 74-473.00R.
Takahashi, Osamu: *See—*
Nanjo, Hirotoshi; Satou, Hiroo; and Takahashi, Osamu, 4,520,778, Cl. 123-352.000.
Takahashi, Tsuneo: *See—*
Nakamura, Yukinobu; Tagami, Katsutoshi; and Takahashi, Tsuneo, 4,521,777, Cl. 340-995.000.
Takaishi, Tatsuyuki: *See—*
Kagiyama, Tsutomu; and Takaishi, Tatsuyuki, 4,520,914, Cl. 192-71.000.
Takami, Satoshi; and Kuroki, Yoshifumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Aperture value control device utilizing frequency signal from flash unit for camera. 4,521,094, Cl. 354-423.000.
Takano, Masao, to Fuji Photo Film Co., Ltd. Method of and cassette for taking X-ray photograph. 4,521,904, Cl. 378-185.000.
Takashima, Hiroaki: *See—*
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,521,294, Cl. 208-23.000.
Takata Corporation: *See—*
Takada, Juichiro, 4,521,034, Cl. 280-804.000.
Takayama, Yasuharu: *See—*
Kuwabara, Yoshiharu; Takayama, Yasuharu; and Hamada, Hiroyoshi, 4,521,113, Cl. 356-387.000.
Takeda Chemical Industries, Ltd.: *See—*
Harada, Setsuo; Shinagawa, Susumu; and Kitano, Kazuaki, 4,521,340, Cl. 260-245.20T.
Kanamaru, Tsuneo; Shinagawa, Susumu; and Asai, Mitsuko, 4,521,432, Cl. 514-556.000.
Oka, Yoshikazu; Nishikawa, Kohei; and Miyake, Akio, 4,521,607, Cl. 549-39.000.
Takeda, Hideo, to Fuji Photo Film Co., Ltd. Coating method and apparatus. 4,521,459, Cl. 427-359.000.
Takeda, Mikio: *See—*
Oh-ishi, Tokuro; Takeda, Mikio; Nakajima, Hiromichi; and Nagao, Taku, 4,521,430, Cl. 514-211.000.
Takehara, Nobuo, to Kabushiki Kaisha Takuma. Device to force out incineration ash. 4,520,738, Cl. 110-171.000.
Takematsu, Tetsuo; Konnai, Makoto; Hosogai, Takeo; and Nishida, Takashi, to Kuraray Co., Ltd. Substituted phenyl carbamates, herbicidal compositions containing the same as active ingredient and method of controlling weeds. 4,521,242, Cl. 71-94.000.
Takenoya, Hideaki: *See—*
Eguchi, Yasukata; Hanyu, Susumu; Takenoya, Hideaki; and Inamori, Mikio, 4,520,987, Cl. 248-635.000.
Tam, Teresa M.: *See—*
Baker, Don R.; and Tam, Teresa M., 4,521,243, Cl. 71-100.000.
Tamai, Takashi; Tomiyama, Shigefumi; and Ohshima, Nobumasa, to Matsushita Electric Industrial Co., Ltd. Temperature and wear sensor for a brake. 4,520,661, Cl. 73-129.000.
Tamehiro, Hiroshi; Mazuda, Hiroo; Ohashi, Mamoru; and Onoe, Yasumitsu, to Nippon Steel Corporation. Method of making wrought high tension steel having superior low temperature toughness. 4,521,258, Cl. 148-12.00F.
Tamminen, Pentti J., to LTH Associates, Ltd. Electrochemical generators and method for the operation thereof. 4,521,497, Cl. 429-27.000.
Tanabe Seiyaku Co., Ltd.: *See—*
Oh-ishi, Tokuro; Takeda, Mikio; Nakajima, Hiromichi; and Nagao, Taku, 4,521,430, Cl. 514-211.000.
Tanabe, Zenichi; Itoh, Katsuhisa; and Watanabe, Yoshiaki, to Sumitomo Light Metal Industries, Ltd. Electrolytic method of producing a high purity aluminum-lithium mother alloy. 4,521,284, Cl. 204-71.000.
Tanagho, Emil A.: *See—*
Schmidt, Richard A.; and Tanagho, Emil A., 4,520,821, Cl. 128-334.00R.
Tanaka, Junzo: *See—*
Hirai, Masayoshi; Tanaka, Junzo; and Ueda, Katsuroh, 4,521,183, Cl. 432-37.000.
Tanaka, Katsuto: *See—*
Kandachi, Takayoshi; Okino, Seiki; Yanai, Toshiharu; and Tanaka, Katsuto, 4,521,454, Cl. 427-168.000.
Tanaka, Kyugo: *See—*
Kabashima, Kazuo; and Tanaka, Kyugo, 4,521,793, Cl. 346-201.000.
Tanaka, Toshie, to Nifco Inc. Hinged mirror image plastic fastener for quick assembly to threaded male members. 4,521,148, Cl. 411-182.000.
Tanaka, Yasuhiko: *See—*
Kimura, Yoshiaki; Nozu, Taketo; and Tanaka, Yasuhiko, 4,521,788, Cl. 346-140.00R.
Tanaka, Yasuhito: *See—*
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,521,415, Cl. 514-252.000.

Tando, Shuichi: *See*—
Harigane, Kotaro; Tando, Shuichi; Takahashi, Kenichi; and Shudo, Hirokazu, 4,520,557, Cl. 29-740.000.

Taneda, Yukinori: *See*—
Kimura, Kazuo; Taneda, Yukinori; Tsuyuki, Shinichi; Suzuki, Shun; Hashimoto, Yoshio; and Sakamoto, Shinichi, 4,520,965, Cl. 242-7.05B.

Tanimoto, Hirotoshi: *See*—
Nishimura, Yasuyuki; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Kuwahara, Takanori; and Tanimoto, Hirotoshi, 4,521,631, Cl. 568-478.000.

Taniuchi, Akira: *See*—
Fujita, Takeshi;; Mori, Shigeo; Kataoka, Hironori; and Taniuchi, Akira, 4,521,586, Cl. 528-297.000.

Tarbox, Bruce H.: *See*—
Bruce, Kenneth E.; Lombardo, Ralph M., Jr.; Tarbox, Bruce H.; and Conway, John W., 4,521,848, Cl. 364-200.000.

Tary, Maria: *See*—
Soos, Rudolf; Kolta, Rezso; Zoltan, Sandor; and Tary, Maria, 4,521,612, Cl. 560-124.000.

Tassone, Joseph V., to Dayco Corporation. Method and apparatus for making a polymeric coated layer. 4,521,362, Cl. 264-136.000.

Tatsumi, Takumi, to Mitsubishi Denki Kabushiki Kaisha. Torque measuring apparatus. 4,520,680, Cl. 73-862.190.

Taub, Ronald H. Display hanger. 4,520,978, Cl. 248-220.400.

Taylor, Christopher J. C.: *See*—
Wiggs, Christopher C.; and Taylor, Christopher J. C., 4,521,204, Cl. 446-198.000.

Taylor, Henry B., III: *See*—
Christen, Jimmie D.; and Taylor, Henry B., III, 4,521,548, Cl. 521-167.000.

Taylor, Ronald T., to Mostek Corporation. Mos output driver circuit avoiding hot-electron effects. 4,521,698, Cl. 307-450.000.

TDK Corporation: *See*—
Harigane, Kotaro; Tando, Shuichi; Takahashi, Kenichi; and Shudo, Hirokazu, 4,520,557, Cl. 29-740.000.

Technical Components Pty. Ltd.: *See*—
Crawford, John S., 4,521,825, Cl. 361-253.000.

Technics GmbH Europa: *See*—
Liebel, Gerhard, 4,521,719, Cl. 315-111.810.

Technology for Energy Corporation: *See*—
Canada, Ronald G.; Piety, Kenneth R.; Simpson, Daniel G.; and Pardue, E. Forrest, 4,520,674, Cl. 73-660.000.

Technology Marketing, Inc.: *See*—
Kraemer, Alan D.; and Kane, James A., 4,521,858, Cl. 364-200.000.

Teijin Limited: *See*—
Norota, Susumi; Kiriyama, Tsutomu; Imoto, Tadashi; and Azumi, Toshinori, 4,521,364, Cl. 264-176.00F.
Shingu, Tadashi; Tsutada, Tadakazu; Nishihara, Toshio; and Suzuki, Nobuo, 4,520,611, Cl. 52-789.000.

Telchuk, Steve E.: *See*—
Gerdes, Donald F.; and Telchuk, Steve E., 4,521,227, Cl. 55-225.000.

Teledyne, Inc.: *See*—
Miller, Robert F., 4,521,664, Cl. 219-76.140.

Teledyne Industries, Inc.: *See*—
Eucken, Craig M., 4,521,259, Cl. 148-20.300.

Teledyne Industries, Inc., Teledyne Water Pik: *See*—
Zackay, Victor F.; and Rowe, Donald R., 4,521,530, Cl. 502-218.000.

Telefonaktiebolaget L M Ericsson: *See*—
Forsberg, Gunnar; and Ingre, Lars, 4,521,920, Cl. 455-619.000.

Temco Home Health Care Products, Inc.: *See*—
Hatala, John, 4,520,515, Cl. 4-579.000.

Templeman, Arthur R., to Peterson Mfg. Co. Mirror assembly. 4,520,983, Cl. 248-481.000.

Terachi, Junichi: *See*—
Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,521,653, Cl. 200-144.00C.

Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,521,413, Cl. 514-203.000.

Terhune, James H., to General Electric Company. Method and apparatus for detecting hydrogen, oxygen and water vapor concentrations in a host gas. 4,520,654, Cl. 73-24.000.

Terhune, James H.; and Neissel, John P., to General Electric Company. Liquid level sensor. 4,521,373, Cl. 376-258.000.

Texaco Inc.: *See*—
Cuscurida, Michael; and Peterson, Bruce W., 4,521,572, Cl. 525-507.000.
Dominguez, Richard J. G.; and Cuscurida, Michael, 4,521,581, Cl. 528-57.000.
Karol, Thomas J., 4,521,318, Cl. 252-46.700.
Sanderson, John R.; Watts, Lewis W., Jr.; Vanderpool, Steven H.; and Renken, Terry L., 4,521,609, Cl. 549-533.000.

Texas A&M University System, The: *See*—
Chiou, George C. Y.; and Liu, Hsin-Kuang, 4,521,414, Cl. 514-229.000.

Texas Instruments Incorporated: *See*—
Caldwell, David; Ferrio, Linda J.; and Hunter, Arthur C., 4,521,868, Cl. 364-753.000.
Coleman, Donald J., Jr.; Haken, Roger A.; and Wang, Chung S., 4,521,446, Cl. 427-86.000.
Dix, Robert M.; Ellis, Timothy A.; and Andrews, Gary W., 4,520,629, Cl. 62-6.000.
Guttag, Karl M., 4,521,852, Cl. 364-200.000.
Guttag, Karl M., 4,521,853, Cl. 364-200.000.
Levine, Jules D., 4,521,640, Cl. 136-250.000.
Logan, Russell H.; and Poradish, Frank J., 4,521,861, Cl. 364-517.000.
Noble, Robert T., 4,521,775, Cl. 340-784.000.
Purdes, Andrew J., 4,521,275, Cl. 156-643.000.
Reddy, Chitranjan N., 4,521,701, Cl. 307-482.000.

Textron Inc.: *See*—
Klein, Gregory L.; and Burton, C. Leonard, 4,521,121, Cl. 384-100.000.

T+F Kunststuffe fur Tecknik und Freizeit GmbH: *See*—
Sommer, Werner, 4,521,361, Cl. 264-126.000.

Thatcher, Arthur K.; and McCarter, Ed R., deceased (by McCarter, Rebecca A., executrix), to Arthur K. Thatcher Revokable Trust. Sonic dispersion unit and control system therefor. 4,520,786, Cl. 123-536.000.

Thayer, John R. Protective helmet with dual adjustment illumination means. 4,521,831, Cl. 362-32.000.

Theeuwes, Felix, to ALZA Corporation. Parenteral agent dispensing equipment. 4,521,211, Cl. 604-85.000.

Thenner, Johann: *See*—
Ruhl, Erich; and Thenner, Johann, 4,521,543, Cl. 521-103.000.

Therma-Wave, Inc.: *See*—
Rosencwaig, Allan, 4,521,118, Cl. 374-5.000.

Thermalloy, Inc : *See*—
Jordan, William D.; Hundt, Roger C.; and Pritchett, James D., 4,521,827, Cl. 361-386.000.

Thermetic Glass, Inc.: *See*—
Miller, Clarence W., 4,520,602, Cl. 52-173.00R.

Theslof, Gene, Jr., to Custom Laboratories, Inc. Slide production system. 4,521,091, Cl. 353-122.000.

Theta Industries, Inc.: *See*—
Stepke, Anthony C.; and Clusener, Gerhard R., 4,521,119, Cl. 374-56.000.

Thiele, Klaus: *See*—
Schumann, Henning; Busch, Peter; Fischer, Detlef; and Thiele, Klaus, 4,520,831, Cl. 132-11.00R.

Thompson, David L.; Roline, Glenn M.; and Harrington, Richard J., to Medtronic, Inc. Digital circuit for control of gradual turn-on of electrical tissue stimulators. 4,520,825, Cl. 128-422.000.

Thomsen, Joelle R.; and Fagerburg, David R., to Eastman Kodak Company. Polyesters and their manufacture from acids and glycol carbonates. 4,521,585, Cl. 528-271.000.

Thomson-CSF: *See*—
Arnould, Jacques; and Tonnel, Eugene, 4,520,552, Cl. 29-571.000.
Broussoux, Dominique; Facoetti, Hugues; Micheron, Francois; and Monnerie, Lucien, 4,521,322, Cl. 252-62.900.

Thumm, Hans: *See*—
Hartmann, Achim; and Thumm, Hans, 4,521,384, Cl. 423-72.000.

Thuries, Edmond, to Alsthom Atlantique. Circuit breaker with incorporated current transformer. 4,521,657, Cl. 200-148.00R.

Tietze, Guenter: *See*—
Kretschmer, Horst; Tietze, Guenter; Noack, Juergen; Schweigel, Hans-Joachim; Schingnitz, Manfred; Werner, Klaus; and Kirsch, Bernd, 4,521,139, Cl. 406-19.000.

Tiger Products, Inc.: *See*—
Prawdzik, Joseph F., 4,521,019, Cl. 273-49.000.

Timmele Laminering AB: *See*—
Ahlm, Lars, 4,520,517, Cl. 5-481.000.

Toaba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, to Daicel Chemical Industries, Ltd. Aqueous dispersion. 4,521,565, Cl. 525-64.000.

Togino, Takayoshi, to Olympus Optical Co., Ltd. Microscope objective. 4,521,083, Cl. 350-414.000.

Toguzov, Mels Z.: *See*—
Yarygin, Vladimir I.; Sannikov, Jury I.; Panchenko, Anatoly I.; Sychev, Anatoly P.; Vikharev, Ivan G.; Kuur, Vyacheslav P.; and Toguzov, Mels Z., 4,521,245, Cl. 75-21.000.

Toho Beslon Co., Ltd.: *See*—
Ogawa, Hiroyasu; Izumi, Kazuo; and Shimazaki, Kenji, 4,520,623, Cl. 57-236.000.

Tohoku University: *See*—
Inaba, Humio; Ito, Hiromasa; and Ogawa, Yoh, 4,521,681, Cl. 250-205.000.

Tokai TRW & Co., Ltd.: *See*—
Abe, Michio, 4,521,141, Cl. 409-48.000.

Tokuyama, Yoshio, to Victor Company of Japan, Limited. Reproducing apparatus capable of performing high-speed reproduction of a video signal. 4,521,815, Cl. 360-10.200.

Tokyo Institute of Technology: *See*—
Yamamoto, Takakazu; Yamamoto, Akio; and Sanechika, Kenichi, 4,521,589, Cl. 528-380.000.

Tokyo Juki Industrial Co., Ltd.: *See*—
Shinomiya, Hiroaki; and Noguchi, Minetoshi, 4,520,745, Cl. 112-266.100.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ando, Hideo, 4,521,680, Cl. 250-201.000.
Hiraki, Shunichi; Kinoshita, Hiroshi; Kumamaru, Kuniaki; Koguchi, Shigeo; and Yonezawa, Toshio, 4,521,256, Cl. 148-1.500.
Hosoya, Masahiro; and Ueno, Tsuyoshi, 4,521,098, Cl. 355-3.0DD.
Kato, Taketoshi; and Onoe, Akira, 4,521,801, Cl. 357-71.000.
Murao, Yutaka; and Nishizono, Taira, 4,521,763, Cl. 340-347.0AD.
Sasaki, Yoshitaka, 4,521,448, Cl. 427-88.000.

Tomburo, Anthony F.; and Kachur, Nicholas W., to Gibson Associates, Inc. Sealed propulsion mechanism for a stick-deodorant or the like container. 4,521,127, Cl. 401-68.000.

Tomcufcik, Andrew S.: *See—*
Dusza, John P.; Tomcufcik, Andrew S.; and Albright, Jay D., 4,521,422, Cl. 514-258.000.
Tominaga, Shigetake: *See—*
Yoshimura, Tatsushiro; and Tominaga, Shigetake, 4,521,596, Cl. 524-406.000.
Tominaga, Yasuhiro. Ball game apparatus. 4,521,016, Cl. 273-29.00A.
Tomisawa, Osamu: *See—*
Shinohara, Hirofumi; Tomisawa, Osamu; Anami, Kenji; and Yoshimoto, Masahiko, 4,521,704, Cl. 307-530.000.
Tomiyama, Shigefumi: *See—*
Tamai, Takashi; Tomiyama, Shigefumi; and Ohshima, Nobumasa, 4,520,661, Cl. 73-129.000.
Tondre, Stephen L.; and Lunk, Hans E., to Raychem Corporation. Electrical insulation. 4,521,485, Cl. 428-383.000.
Tonnel, Eugene: *See—*
Arnould, Jacques; and Tonnel, Eugene, 4,520,552, Cl. 29-571.000.
Topfl, Werner: *See—*
Kristinsson, Haukur; and Topfl, Werner, 4,521,597, Cl. 544-3.000.
Toppan Printing Company, Ltd.: *See—*
Kitajima, Nobuyuki; Tachibana, Yoshinori; Muraki, Asashi; and Kuzuoka, Shinichi, 4,521,355, Cl. 264-60.000.
Torin Corporation: *See—*
Lampietti, Bernard P., 4,520,644, Cl. 72-131.000.
Toshiba Ceramics Co. Limited: *See—*
Saito, Hajime; and Urakawa, Tetsuro, 4,521,393, Cl. 423-344.000.
Toshiba Electric Appliances Co., Ltd.: *See—*
Katagiri, Nobuhiko; Matsubara, Hidenobu; and Iida, Akio, 4,520,864, Cl. 165-60.000.
Tou, Jacob S.; and Schlepnik, Alfred A., to Monsanto Company. Cyano-dicarboxylate. 4,521,344, Cl. 260-465.00D.
Towmotor Corporation: *See—*
Liljequist, Lawrence A.; Wible, John E.; and Schwehr, Richard A., 4,520,986, Cl. 248-585.000.
Melocik, Grant C.; and Pickering, William, 4,521,885, Cl. 371-29.000.
Townsend, Rodney C., to Mine Support Systems (Proprietary) Ltd. Elongate compression bearing member. 4,520,980, Cl. 248-351.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Oyama, Kiyotaka; Irino, Shigeaki; Harada, Tsuneo; and Nakamura, Masao, 4,521,514, Cl. 435-70.000.
Toyonaga, Noriyasu, to Fujitsu Limited. Data transmitting-receiving system. 4,521,878, Cl. 370-19.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Isobe, Toshiaki; and Fukuda, Teruo, 4,520,784, Cl. 123-492.000.
Ito, Yoshiyasu; Kobayashi, Fumiaki; and Miyagi, Hideo, 4,520,780, Cl. 123-359.000.
Ito, Yuji, 4,520,543, Cl. 29-227.000.
Matsushita, Souichi; Nakanishi, Kiyoshi; and Inoue, Tokuta, 4,520,783, Cl. 123-492.000.
Toyozawa, Yukio: *See—*
Sakamoto, Keiji; and Toyozawa, Yukio, 4,521,724, Cl. 318-762.000.
Tozzolino, Pierre: *See—*
Detienne, Jean-Louis; Levesque, Guy; and Tozzolino, Pierre, 4,521,301, Cl. 209-166.000.
Transnuklear GmbH: *See—*
Christ, Richard; Muller, Erhard; Knackstedt, Hans-Gunther; and Laug, Reiner, 4,521,691, Cl. 250-506.100.
TRE Semiconductor Equipment Corporation: *See—*
Van Peski, Christian K.; and Meisenheimer, William L., 4,521,114, Cl. 356-401.000.
Tremmel, Robert A., to OMI International Corporation. Cyanide-free copper electrolyte and process. 4,521,282, Cl. 204-52.00R.
Tripp, Edwin P., III: *See—*
Nablo, Sam V.; and Tripp, Edwin P., III, 4,521,445, Cl. 427-44.000.
Trubisky, Leonard G.; and Shelly, William A., to Honeywell Information Systems Inc. Central processor. 4,521,851, Cl. 364-200.000.
Trussler, Ronald C.: *See—*
deHertel Eastcott, Peter; and Trussler, Ronald C., 4,520,910, Cl. 192-0.02R.
TRW Inc.: *See—*
Jones, Robert J.; and Chang, Glenn E. C., 4,521,623, Cl. 564-430.000.
Rau, Bantwal R.; Glaeser, Christopher D.; and Kuekes, Philip J., 4,521,874, Cl. 365-221.000.
Tahim, Raghbir S.; Hayashibara, George M.; and Chang, Kai, 4,521,747, Cl. 331-107.0SL.
Tsien, Hsue C., to Exxon Research & Engineering Co. Method of coextruding plastics to form a composite sheet. 4,521,359, Cl. 264-104.000.
Tsubouchi, Toshiyuki; and Hata, Hitoshi, to Idemitsu Kosan Company Limited. Fluid for traction drive. 4,521,324, Cl. 252-73.000.
Tsuchiya, Koji: *See—*
Kunihiro, Takatoshi; and Tsuchiya, Koji, 4,521,296, Cl. 208-87.000.
Tsuda, Yukio: *See—*
Yamada, Takaaki; Tsuda, Yukio; and Yamakoshi, Akira, 4,521,744, Cl. 331-1.00A.
Tsuji, Katsuyuki: *See—*
Kiyota, Yuhiko; Tsuji, Katsuyuki; Kume, Satoru; Takada, Hiroaki; Shinsei, Kiyoichi; Matsumoto, Akio; and Ogawa, Hitoshi, 4,520,624, Cl. 60-286.000.
Tsumura, Kenji; and Yamashita, Masayuki, to Oriental Metal Mfg. Co., Ltd. Concentrating apparatus. 4,521,276, Cl. 159-1.00W.
Tsutada, Tadakazu: *See—*
Shingu, Tadashi; Tsutada, Tadakazu; Nishihara, Toshio; and Suzuki, Nobuo, 4,520,611, Cl. 52-789.000.
Tsuyama Mfg. Co., Ltd.: *See—*
Uyeda, Takashi; and Matsumoto, Masaaki, 4,521,731, Cl. 324-174.000.
Tsuyuki, Shinichi: *See—*
Kimura, Kazuo; Taneda, Yukinori; Tsuyuki, Shinichi; Suzuki, Shun; Hashimoto, Yoshio; and Sakamoto, Shinichi, 4,520,965, Cl. 242-7.05B.
Tucker, Burnis H.: *See—*
Moore, Jeff D.; Moore, Eddie C.; Tucker, Burnis H.; and Goodwill, William P., 4,520,681, Cl. 73-862.280.
Tuckey, Charles H., to Walbro Corporation. Rotary fuel pump with pulse modulation. 4,521,164, Cl. 417-307.000.
Turbon, Klaus, to Turbon Plastics, U.S.A., Inc. Ribbon cassette assembly. 4,521,125, Cl. 400-208.000.
Turbon Plastics, U.S.A., Inc.: *See—*
Turbon, Klaus, 4,521,125, Cl. 400-208.000.
Turin, William: *See—*
Dollard, Peter M.; and Turin, William, 4,521,886, Cl. 371-43.000.
Turner, S. Richard; Siano, Donald B.; and Bock, Jan, to Exxon Research & Engineering Co. Microemulsion process for producing acrylamide-alkyl acrylamide copolymers. 4,521,580, Cl. 526-307.200.
Tyndall, Jack L.: *See—*
Viglione, Vincent; and Tyndall, Jack L., 4,520,996, Cl. 254-9.00C.
Uchiyama, Takako: *See—*
Kida, Koichi; Aoyama, Tetsuo; and Uchiyama, Takako, 4,521,638, Cl. 585-640.000.
Ueda, Katsuroh: *See—*
Hirai, Masayoshi; Tanaka, Junzo; and Ueda, Katsuroh, 4,521,183, Cl. 432-37.000.
Uemura, Masayuki; Murauchi, Akitsugu; and Izushi, Takehiro, to Nintendo Co., Ltd. Apparatus for displaying grouped characters in scanning type display. 4,521,020, Cl. 273-85.00G.
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hircaki; and Kato, Osamu, to Nippon Oil Co., Ltd. Starting pitches for carbon fibers. 4,521,294, Cl. 208-23.000.
Ueno, Ichiro, to Victor Company of Japan, Limited. Focusing state monitoring apparatus in optical recording apparatus. 4,521,876, Cl. 369-54.000.
Ueno, Tsuyoshi: *See—*
Hosoya, Masahiro; and Ueno, Tsuyoshi, 4,521,098, Cl. 355-3.0DD.
Underwood, J. Larry. Mold, process of molding, and article molded by such process. 4,521,367, Cl. 264-318.000.
Union Camp Corporation: *See—*
Mitchell, Peter W. D., 4,521,608, Cl. 549-397.000.
Mitchell, Peter W. D., 4,521,627, Cl. 564-511.000.
Union Carbide Corporation: *See—*
Cain, Paul A., 4,521,426, Cl. 514-346.000.
Lee, Kiu H.; and Cieloszyk, Gary S., 4,521,573, Cl. 526-125.000.
Severance, Wayne S., Jr.; and Rogers, George T., 4,521,666, Cl. 217-121.0PY.
Union Oil Company of California: *See—*
Kelley, Arnold E.; Block, Michael J.; and Skripek, Milan R., 4,521,278, Cl. 201-17.000.
Switzer, Jay A., 4,521,499, Cl. 429-111.000.
Unisearch Limited: *See—*
Horwitz, Christopher M., 4,521,286, Cl. 204-192.00E.
United Kingdom Atomic Energy Authority: *See—*
Hodgson, Thomas D.; and Foot, William R., 4,521,400, Cl. 423-658.500.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Davies, David G., 4,521,261, Cl. 149-92.000.
Fitzgerald-Smith, James P.; Bird, Bertram; and Willis, Michael, 4,520,523, Cl. 14-2.400.
United States of America
Administrator, National Aeronautics and Space Administration: *See—*
Kleinberg, Leonard L., 4,521,702, Cl. 307-520.000.
Agriculture: *See—*
Blank, Richard W.; and Simard, Albert J., 4,521,120, Cl. 374-102.000.
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Walker, Eugene P., to Harsco Corporation. Concrete core-wall form and stripping assembly therefor. 4,520,988, Cl. 249-13.000.
Wallace, Leonard D. Tubular fishing rod with integral handle-reel seat. 4,520,587, Cl. 43-18.100.
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Watanabe, Eifu, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Steering device for an outboard motor. 4,521,201, Cl. 440-55.000.
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Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Ohlinger, Manfred; Wilfinger, Hans J.; Pfannebecker, Emil; and Duffner, Paul, 4,521,527, Cl. 502-184.000.

Wilfley, George M.: *See*—
Weber, Richard B.; Wilfley, George M.; and Wilfley, George M., 4,521,349, Cl. 261-93.000.
Weber, Richard B.; Wilfley, George M.; and Wilfley, George M., 4,521,349, Cl. 261-93.000.

Wilhite, John E.; Shelly, William A.; and Ryan, Charles P., to Honeywell Information Systems Inc. Instruction buffer associated with a cache memory unit. 4,521,850, Cl. 364-200.000.

Wilkins, Cletus W., Jr.: *See*—
Reichmanis, Elsa; and Wilkins, Cletus W., Jr., 4,521,274, Cl. 156-643.000.

Willert, Manfred: *See*—
Weber, Klaus; Willert, Manfred; and Blessmann, Heinz, 4,521,076, Cl. 350-254.000.

Williams, Frank M. Golf training device. 4,521,023, Cl. 273-183.00B.

Willim, Friedrich: *See*—
Werner, Eberhard; and Willim, Friedrich, 4,520,643, Cl. 72-39.000.

Willis, Donald H.: *See*—
Stoughton, John W.; and Willis, Donald H., 4,521,811, Cl. 358-243.000.

Willis, Michael: *See*—
Fitzgerald-Smith, James P.; Bird, Bertram; and Willis, Michael, 4,520,523, Cl. 14-2.400.

Willmann, Claude, to Societe Anonyme Dite: Etablissements Tourtellier S.A. Guide rail and follower wheel construction for monorail. 4,520,733, Cl. 104-93.000.

Wilsford, Jo Ann: *See*—
Wilsford, Robert L., deceased, 4,521,043, Cl. 294-19.100.

Wilsford, JoAnn, executor: *See*—
Wilsford, Robert L., deceased, 4,521,043, Cl. 294-19.100.

Wilsford, Robert L., deceased (by Wilsford, JoAnn, executor), to Wilsford, Jo Ann. Trash bagging apparatus. 4,521,043, Cl. 294-19.100.

Wilson, James D. Nestable/stackable containers for bakery goods and the like. 4,520,928, Cl. 206-505.000.

Wilson, Robert G.: *See*—
Lehneis, Hans R.; and Wilson, Robert G., 4,520,512, Cl. 3-22.000.

Wilson, Stanley, to Advanced Micro Devices, Inc. High-speed schottky TTL gate apparatus. 4,521,699, Cl. 307-456.000.

Windawi, Hassan; Grieger, Gene R.; and Oakdale, Warren R., to UOP Inc. Conversion of gases to useable products. 4,521,394, Cl. 423-363.000.

Wine, Charles M., to RCA Corporation. Frequency synthesis tuning control system for a double-conversion tuner. 4,521,916, Cl. 455-182.000.

Winfield Corp.: *See*—
Nelson, Ralph E., 4,520,926, Cl. 206-366.000.

Winkler, Dean M.; Curtis, Jeffrey B.; and Heller, Aaron J. Programmable function generator. 4,521,865, Cl. 364-608.000.

Winkler, Jurgen: *See*—
Goyert, Wilhelm; and Winkler, Jurgen, 4,521,582, Cl. 528-67.000.

Winter, Arthur J., to Databar Corporation. Battery-powered optical bar code reader and voltage regulator therefor. 4,521,678, Cl. 235-472.000.

Wirz, Francois: *See*—
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Withycombe, Donald A.: *See*—
Rutherford, Howard J.; and Withycombe, Donald A., 4,521,541, Cl. 521-79.000.

Witkin, Roy T.: *See*—
Simon, Gilbert I.; and Witkin, Roy T., 4,521,403, Cl. 424-51.000.

Witonsky, Robert J.; and Larsson, Raymond P., to Info-Chem Inc. Glutaraldehyde indicator. 4,521,376, Cl. 422-56.000.

Wivinis, Gerald P. Tool for removing automotive door panels. 4,520,564, Cl. 30-168.000.

Wlasitsch, Gyula: *See*—
Schroer, Walter; and Wlasitsch, Gyula, 4,521,465, Cl. 428-35.000.

Wodlinger, Harold; and Katz, Hart V. System for determining the first prematurity contact of dental occlusion. 4,521,186, Cl. 433-71.000.

Wolde-Michael, Girma, to Donaldson Company, Inc. Fluid purification system. 4,521,313, Cl. 210-776.000.

Wolf, Marvin L., to FMC Corporation. Load supporting structure. 4,520,888, Cl. 180-125.000.

Wolf, Wolfram: *See*—
Aykut, Kurt, deceased; Aykut, Eva-Marie, executor; and Wolf, Wolfram, 4,520,614, Cl. 53-540.000.

Wolfrum, Gerhard: *See*—
Stolzenburg, Rudolf; Bergthaller, Peter; Wolfrum, Gerhard; and Strauss, Jurgen, 4,521,506, Cl. 430-241.000.

Wollgarten, Kurt: *See*—
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Wolter, Heinz. Light. 4,521,833, Cl. 362-116.000.

Wolze, Martin H. Champagne bottle opener. 4,520,696, Cl. 81-3.550.

Wong, Vernon G. Eye implant for relieving glaucoma, and device and method for use therewith. 4,521,210, Cl. 604-8.000.

Woods, Charles E.: *See*—
Clark, Keith E.; and Woods, Charles E., 4,520,973, Cl. 244-3.160.

World Video Library, Inc.: *See*—
Abraham, Nicholas F., 4,521,806, Cl. 358-86.000.

Worley, Robert F.; and Petras, Jeffrey L., to Donn Incorporated. Grid tee for suspension ceilings or the like. 4,520,609, Cl. 52-729.000.

Wormald Fire Systems, Inc.: *See*—
Miller, Walter G.; Mace, Michel; and Zitterbart, George, 4,520,871, Cl. 169-43.000.

Wright Line Inc.: *See*—
Cournoyer, Bernard T.; and Hedstrom, Norman A., 4,520,976, Cl. 248-56.000.

Wright, Roger D.: *See*—
Hilker, G. Daniel; Lausen, Verne H.; Coon, Jessie H.; Bodette, James E.; Grimes, Jerry L.; Wright, Roger D.; Disque, Donny R.; and Bultemeier, Keith D., 4,521,173, Cl. 425-113.000.

Wright, Thomas C.; and Ober, Stephen H., to EMPI, Inc. NMS aided continuous passive motion apparatus. 4,520,827, Cl. 128-423.00W.

Wright, Thomas J.: *See*—
Sillivent, Bob; and Sillivent, Clifford, 4,520,917, Cl. 198-499.000.

Wuerzer, Bruno: *See*—
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Wulfing, James J.; and Rood, Robert M., to Minnesota Mining and Manufacturing Company. Videocassette tape spool having a wear button. 4,520,969, Cl. 242-71.800.

Wyland, Alvin D.; Smith, Duaine W.; and Blackburn, Louis W., to Amana Refrigeration, Inc. Microwave oven scale apparatus. 4,521,658, Cl. 219-10.55B.

Wysk, Hans-Joachim: *See*—
Schafer, Rolf; Vogelhuber, Peter; and Wysk, Hans-Joachim, 4,521,122, Cl. 400-124.000.

Xerox Corporation: *See*—
Bain, Lee L., 4,521,786, Cl. 346-140.00R.
Clark, Lloyd D.; Wilcox, Jean K.; and Day, Gene F., 4,521,792, Cl. 346-159.000.
Day, Gene F., 4,521,791, Cl. 346-159.000.
Lyon, Richard F., 4,521,772, Cl. 340-710.000.
Lyon, Richard F., 4,521,773, Cl. 340-710.000.
Russell, Philip P.; Niu, Tyan-Faung; and Holland, Frederic A., 4,521,457, Cl. 427-286.000.
Yanus, John F.; and Limburg, William W., 4,521,621, Cl. 564-307.000.
Ziehm, Richard T.; Wilczek, Stephen P.; Baker, George E.; Husted, Raymond R.; Dumas, Glen A.; Bunker, Keith G.; and Place, George H., Jr., 4,521,847, Cl. 364-184.000.

Yaegashi, Masayuki: *See*—
Doi, Hachiro; and Yaegashi, Masayuki, 4,520,619, Cl. 56-320.100.

Yagi, Eiji: *See*—
Haiori, Yukiyoshi; Yagi, Eiji; and Kobari, Yuji, 4,520,777, Cl. 123-339.000.

Yakich, Joseph. Cribbage board. 4,521,675, Cl. 235-90.000.

Yamada, Jun: *See*—
Suzuki, Shigeyoshi; Yamada, Jun; Senga, Takao; Kuriu, Sadao; Yamasaki, Masahiro; Hirose, Iwao; and Maegawa, Tokubee, 4,521,101, Cl. 355-10.000.

Yamada, Masanori: *See*—
Kawabata, Takashi; and Yamada, Masanori, 4,521,093, Cl. 354-403.000.

Yamada, Mutsuo: *See—*
Nishimura, Yasuyuki; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Kuwahara, Takanori; and Tanimoto, Hirotoshi, 4,521,631, Cl. 568-478.000.

Yamada, Takaaki; Tsuda, Yukio; and Yamakoshi, Akira, to Sony Corporation. Tuning apparatus of phase-locked loop type. 4,521,744, Cl. 331-1.00A.

Yamagata, Shinji: *See—*
Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, 4,521,653, Cl. 200-144.00C.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Marier, Gregory J., 4,520,890, Cl. 180-193.000.
Nakahama, Ryoji, 4,521,202, Cl. 440-61.000.
Nakamura, Haruo, 4,520,775, Cl. 123-308.000.
Watanabe, Eifu, 4,521,201, Cl. 440-55.000.

Yamakoshi, Akira: *See—*
Yamada, Takaaki; Tsuda, Yukio; and Yamakoshi, Akira, 4,521,744, Cl. 331-1.00A.

Yamamoto, Akio: *See—*
Yamamoto, Takakazu; Yamamoto, Akio; and Sanechika, Kenichi, 4,521,589, Cl. 528-380.000.

Yamamoto, Masashi: *See—*
Mitsuno, Tatsuyuki; and Yamamoto, Masashi, 4,521,487, Cl. 428-407.000.

Yamamoto, Minoru; Sakata, Jiro; and Doi, Haruo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for preparation of porous glass film. 4,521,236, Cl. 65-31.000.

Yamamoto, Ryoichi: *See—*
Ichimura, Mitsunori; Yamamoto, Ryoichi; and Horimoto, Katsutoshi, 4,521,378, Cl. 422-135.000.

Yamamoto, Shunichi: *See—*
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,521,294, Cl. 208-23.000.

Yamamoto, Takakazu; Yamamoto, Akio; and Sanechika, Kenichi, to Tokyo Institute of Technology. Linear poly(3-alkyl-2,5-thienylene) polymer. 4,521,589, Cl. 528-380.000.

Yamamoto, Toshiharu: *See—*
Iijima, Tokuzo; Yamamoto, Toshiharu; Kishimoto, Kazuo; Komabashiri, Takamichi; Kano, Toshiji; and Hisanaga, Akinori, 4,521,289, Cl. 204-253.000.

Yamamoto, Yoshihiro; Suzuki, Junichiro; and Nakamura, Minoru, to NGK Spark Plug Co., Ltd. Process for producing titanium nitride base cermets with high toughness. 4,521,248, Cl. 75-238.000.

Yamasaki, Masahiro: *See—*
Suzuki, Shigeyoshi; Yamada, Jun; Senga, Takao; Kuriu, Sadao; Yamasaki, Masahiro; Hirose, Iwao; and Maegawa, Tokubee, 4,521,101, Cl. 355-10.000.

Yamashita, Keitaro: *See—*
Samuels, Abe; Yamashita, Keitaro; and Sasaki, Yoshitaka, 4,521,184, Cl. 432-60.000.

Yamashita, Kiyoshi: *See—*
Iijima, Toshifumi; and Yamashita, Kiyoshi, 4,521,507, Cl. 430-503.000.

Yamashita, Masayuki: *See—*
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Yamashita, Michio: *See—*
Suzuki, Shoichi; Ohta, Wataru; Sakurai, Noriaki; and Yamashita, Michio, 4,521,133, Cl. 405-195.000.

Yamashita, Toshiharu, to Hoya Corporation. Contrast enhancement filter for color CRT display devices. 4,521,524, Cl. 501-64.000.

Yamazaki Machinery Works, Ltd.: *See—*
Kanematsu, Hiroyuki; Nagae, Akimitsu; Mizoguchi, Kiyohisa; and Ohashi, Hajime, 4,521,860, Cl. 364-474.000.

Yanai, Toshiharu: *See—*
Kandachi, Takayoshi; Okino, Seiki; Yanai, Toshiharu; and Tanaka, Katsuto, 4,521,454, Cl. 427-168.000.

Yanus, John F.; and Limburg, William W., to Xerox Corporation. Squaraine systems. 4,521,621, Cl. 564-307.000.

Yarygin, Vladimir I.; Sannikov, Jury I.; Panchenko, Anatoly I.; Sychev, Anatoly P.; Vikharev, Ivan G.; Kuur, Vyacheslav P.; and Toguzov, Mels Z. Method of processing sulphide copper- and/or sulphide copper-zinc concentrates. 4,521,245, Cl. 75-21.000.

Yata, Kiyoshi: *See—*
Sawada, Hideo; and Yata, Kiyoshi, 4,521,872, Cl. 365-49.000.

Yazaki, Takashi: *See—*
Itsubo, Junichi; Yazaki, Takashi; and Mori, Fumio, 4,520,939, Cl. 215-252.000.

Yeack-Scranton, Celia E.: *See—*
Bednorz, Johannes G.; Hollis, Ralph L., Jr.; Lanz, Martin; Pohl, Wolfgang D.; and Yeack-Scranton, Celia E., 4,520,570, Cl. 33-180.00R.

Yin, Lo I., to United States of America, National Aeronautics and Space Administration. Three-dimensional and tomographic imaging device for x-ray and gamma-ray emitting objects. 4,521,688, Cl. 250-363.00S.

Yogi, Seigi; and Spector, George. Foot brush. 4,520,525, Cl. 15-104.920.

Yokohama Rubber Co., Ltd., The: *See—*
Suzuki, Shoichi; Ohta, Wataru; Sakurai, Noriaki; and Yamashita, Michio, 4,521,133, Cl. 405-195.000.

Yokota, Hiromu: *See—*
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Yokota, Masami; Sugitani, Hiroshi; and Inamoto, Tadayoshi, to Canon Kabushiki Kaisha. Ink jet recording head. 4,521,787, Cl. 346-140.00R.

Yokota, Mitsuyoshi: *See—*
Matsumoto, Akio; and Yokota, Mitsuyoshi, 4,521,651, Cl. 200-83.00R.

Yonemori, Takaji; and Sagara, Seiji, to Canon Kabushiki Kaisha. Variable magnification image forming apparatus. 4,521,100, Cl. 355-8.000.

Yonezawa, Toshio: *See—*
Hiraki, Shunichi; Kinoshita, Hiroshi; Kumamaru, Kuniaki; Koguchi, Shigeo; and Yonezawa, Toshio, 4,521,256, Cl. 148-1.500.

Yoshida Kogyo K. K.: *See—*
Kasai, Kazumi, 4,520,535, Cl. 24-410.000.
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Nakagawa, Toshiaki, 4,520,560, Cl. 29-708.000.
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Yoshida, Motoaki: *See—*
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Yoshida, Takashi; Fujie, Masakatsu; Matsuno, Junichi; and Ouchi, Hideyuki, to Hitachi, Ltd. Recording method in a facsimile receiver. 4,521,813, Cl. 358-296.000.

Yoshimi, Kazuyoshi: *See—*
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Yoshimoto, Masahiko: *See—*
Shinohara, Hirofumi; Tomisawa, Osamu; Anami, Kenji; and Yoshimoto, Masahiko, 4,521,704, Cl. 307-530.000.

Yoshimura, Tatsushiro; and Tominaga, Shigetake, to Daikin Kogyo Co., Ltd. Fluororesin-containing coating composition. 4,521,596, Cl. 524-406.000.

Yoshiyasu, Hajimu; Murata, Shirou; Hisatsune, Fumiyuki; Yamagata, Shinji; and Terachi, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker with arc light absorber. 4,521,653, Cl. 200-144.00C.

Young, Ian R.: *See—*
Burl, Michael; and Young, Ian R., 4,520,828, Cl. 128-653.000.

Young, Michael S. Endotracheal tube holder. 4,520,813, Cl. 128-207.170.

Young, Rodney C.: *See—*
Brown, Thomas H.; and Young, Rodney C., 4,521,625, Cl. 564-461.000.

Yount, Gary L., to Biocon, Inc. Apparatus for biodegrading organic waste. 4,521,304, Cl. 210-96.100.

Zachariades, Anagnostis E.: *See—*
Economy, James; and Zachariades, Anagnostis E., 4,520,647, Cl. 72-365.000.

Zackay, Victor F.; and Rowe, Donald R., to Teledyne Industries, Inc., Teledyne Water Pik. Catalyst of palladium, copper and nickel on a substrate. 4,521,530, Cl. 502-218.000.

Zaschke, Horst: *See—*
Demus, Dietrich; Vorbrodt, Hans-Matthias; Hauser, Anton; Vogel, Jorg; and Zaschke, Horst, 4,521,327, Cl. 252-299.610.

Zeeh, Bernd: *See—*
Meyer, Norbert; Zeeh, Bernd; Buschmann, Ernst; and Pommer, Ernst-Heinrich, 4,521,429, Cl. 514-383.000.

Zeidler, Georg: *See—*
Armbrust, Herbert; Dix, Johannes P.; Hansen, Guenter; and Zeidler, Georg, 4,521,216, Cl. 8-639.000.

Zeller, Bary L.; Kaleda, William W.; and Saleeb, Fouad Z., to General Foods Corporation. Coffee extract decaffeination method. 4,521,438, Cl. 426-271.000.

Zenith Electronics Corporation: *See—*
Griffey, Donald E., 4,521,720, Cl. 315-386.000.
Merrell, Richard G., 4,521,897, Cl. 377-115.000.

Zens, John F.: *See—*
Rea, Gerald M.; Stoff, William G.; and Zens, John F., 4,521,050, Cl. 296-192.000.

Zermeno, Alfonso: *See—*
Ong, Poen S.; Zermeno, Alfonso; Marsh, Lee M., Jr.; Hevezi, James M.; and Cowart, Ronald W., 4,521,808, Cl. 358-111.000.

Ziegenhorn, Joachim: *See—*
Draeger, Brigitte; and Ziegenhorn, Joachim, 4,521,519, Cl. 436-17.000.

Ziegler, Horst, to Siemens Aktiengesellschaft. Pressure or pressure difference measuring transducer. 4,520,675, Cl. 73-718.000.

Ziehm, Richard T.; Wilczek, Stephen P.; Baker, George E.; Husted, Raymond R.; Dumas, Glen A.; Bunker, Keith G.; and Place, George H., Jr., to Xerox Corporation. Control system job recovery after a malfunction. 4,521,847, Cl. 364-184.000.

Ziemek, Gerhard; Schatz, Friedrich; and Meyer, Hermann, to Kabelmetal Electro GmbH. Stranding device. 4,520,622, Cl. 57-59.000.

Zientek, Lucy J.: *See—*
Chang, Tiang-Shing; and Zientek, Lucy J., 4,521,551, Cl. 523-120.000.

Zilke, Robert W., Jr.: *See—*
Rehfuss, John W.; Hazelwood, Louis S.; Price, Martin B.; and Zilke, Robert W., Jr., 4,521,489, Cl. 428-412.000.

Zitterbart, George: *See—*
Miller, Walter G.; Mace, Michel; and Zitterbart, George, 4,520,871, Cl. 169-43.000.

Zoltan, Sandor: *See—*
Soos, Rudolf; Kolta, Rezso; Zoltan, Sandor; and Tary, Maria, 4,521,612, Cl. 560-124.000.

Zurn, Georg: *See—*
Schiel, Christian; Zurn, Georg; and Schmid, Karl, 4,520,578, Cl. 34-110.000.

Zylbert, Thaddeus J., to Singer Company, The. Needle thread tensioning device for a sewing machine. 4,520,743, Cl. 112-255.000.

4D Incorporated: *See—*
Drenner, Dewey A., 4,520,568, Cl. 33-143.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF JUNE, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Crompton & Knowles Corporation: *See*—
Faillace, Louie M., Re. 31,903, Cl. 165-12.000.
Du Pont de Nemours, E. I., and Company: *See*—
Poirier, Robert V., Re. 31,907, Cl. 525-276.000.
Faillace, Louie M., to Crompton & Knowles Corporation. Extruder temperature controller. Re. 31,903, Cl. 165-12.000.
Hitachi, Ltd.: *See*—
Oyama, Yoshishige; Yamauchi, Teruo; and Nishimura, Yutaka, Re. 31,906, Cl. 364-431.060.
Mendenhall, Robert L. Method and apparatus for recycling asphalt-aggregate compositions. Re. 31,904, Cl. 366-25.000.
Mendenhall, Robert L. Method and apparatus for recycling asphalt-aggregate compositions. Re. 31,905, Cl. 106-281.00R.
Nishimura, Yutaka: *See*—
Oyama, Yoshishige; Yamauchi, Teruo; and Nishimura, Yutaka, Re. 31,906, Cl. 364-431.060.
Oyama, Yoshishige; Yamauchi, Teruo; and Nishimura, Yutaka, to Hitachi, Ltd. Control system for internal combustion engine. Re. 31,906, Cl. 364-431.060.
Petrik, John T.; and Westover, Brooke N., to Sun Chemical Corporation. Glow plug. Re. 31,908, Cl. 219-270.000.
Poirier, Robert V., to Du Pont de Nemours, E. I., and Company. Tetrafluoroethylene copolymer fine powder resin. Re. 31,907, Cl. 525-276.000.
Sun Chemical Corporation: *See*—
Petrik, John T.; and Westover, Brooke N., Re. 31,908, Cl. 219-270.000.
Westover, Brooke N.: *See*—
Petrik, John T.; and Westover, Brooke N., Re. 31,908, Cl. 219-270.000.
Yamauchi, Teruo: *See*—
Oyama, Yoshishige; Yamauchi, Teruo; and Nishimura, Yutaka, Re. 31,906, Cl. 364-431.060.

LIST OF DESIGN PATENTEES

Adams, Peter G., to Hestair Kiddicraft Limited. Weighted ball rattle toy. 279,117, 6-4-85, Cl. D21-65.000.
Adell, Robert, to U.S. Product Development Company. Pen. 279,114, 6-4-85, Cl. D19-42.000.
Allen, James H., to 'totes' incorporated. Combined garment bag and overnight case. 279,048, 6-4-85, Cl. D3-71.000.
American Standard Inc.: *See*—
Niemann, James E., 279,123, Cl. D23-32.000.
Apparel Form Company: *See*—
Sears, I. Weir; Hostetler, John E.; and Hulsebusch, William H., 279,041, Cl. D2-28.000.
Aquilina, Eddie O., deceased; and Aquilina, Lacadena, heir. Jump suit. 279,042, 6-4-85, Cl. D2-29.000.
Aquilina, Lacadena, heir: *See*—
Aquilina, Eddie O., deceased; and Aquilina, Lacadena, heir, 279,042, Cl. D2-29.000.
Asoma OY: *See*—
Soininen, Jarmo A., 279,046, Cl. D3-36.000.
Soininen, Jarmo A., 279,047, Cl. D3-36.000.
Ayotte, Raymond D. Drum clamp bracket. 279,103, 6-4-85, Cl. D17-22.000.
Ayres, Richard E. Housing for an electrical prod. 279,133, 6-4-85, Cl. D30-32.000.
B. F. Goodrich Company, The: *See*—
Lassan, Timothy J.; and Skerl, Richard J., 279,087, Cl. D12-147.000.
Wright, David A., 279,089, Cl. D12-147.000.
Baker, Olin H.; and Reilly, Robert P., to Meese, Inc. Quill can. 279,134, 6-4-85, Cl. D34-43.000.
Balbis, Manuel G.; and Hinrichsen, Silvana, to Firestone Tire & Rubber Company, The. Tire for road vehicles. 279,091, 6-4-85, Cl. D12-151.000.
Baum, Elliot I., to QT&T, Inc. Combined clock radio and telephone base. 279,099, 6-4-85, Cl. D14-73.000.
Bayerische Motoren Werke, AG: *See*—
Gevert, Klaus V., 279,086, Cl. D12-110.000.
Beall, Betty M. Portfolio. 279,113, 6-4-85, Cl. D19-26.000.
Bean Station Furniture Factory, The: *See*—
Nelson, Deborah L., 279,056, Cl. D6-381.000.
Becker, Robert W.: *See*—
Morrison, Thurber H.; Becker, Robert W.; and Huff, Robert S., 279,070, Cl. D7-325.000.
Berger, Robert M., to Intercon Purchasing Industries (USA) Ltd. Lamp. 279,130, 6-4-85, Cl. D26-62.000.
Boeing Company, The: *See*—
Ferrell, Jay A.; Kimes, Lucas J.; and Spitzer, Robert E., 279,094, Cl. D12-340.000.
Bolduc, Richard, to Domco Industries Ltd. Combined modular display rack and lighting fixtures unit. 279,057, 6-4-85, Cl. D6-399.000.
Brandsma, Sies K., to U.S. Philips Corporation. Portable radio receiver. 279,098, 6-4-85, Cl. D14-70.000.
Bridgestone Tire Company Limited: *See*—
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591 4,520,554
603 4,520,555
606 4,520,556
708 4,520,560
740 4,520,557
749 4,520,558
766 4,520,559
840 4,520,561
878 4,520,562

CLASS 30

122 4,520,563
168 4,520,564
201 4,520,565
342 4,520,566
424 4,520,567

CLASS 33

143 R 4,520,568
148 E 4,520,569
180 R 4,520,570
189 4,520,571
270 4,520,572
438 4,520,573

CLASS 34

59 4,520,622
236 4,520,623

CLASS 60

286 4,520,624
464 4,520,625
468 4,520,626
599 4,520,627
616 4,520,628

CLASS 62

6 4,520,629
4,520,630
188 4,520,631
403 4,520,632
457 4,520,633
476 4,520,634

CLASS 65

29 4,521,235
31 4,521,236
42 4,521,237
135 4,521,238

CLASS 66

185 4,520,635
192 4,520,636

CLASS 68

5 D 4,520,637
133 4,520,638

CLASS 70

110 4,520,639
248 4,520,640
312 4,520,641

CLASS 71

27 4,521,239
88 4,521,240
92 4,521,241
94 4,521,242
100 4,521,243

CLASS 72

8 4,520,642
39 4,520,643
131 4,520,644
250 4,520,645
313 4,520,646
365 4,520,647
391 4,520,648
457 4,520,649

CLASS 73

3 4,520,650
23 4,520,651
4,520,652
4,520,653
24 4,520,654
46 4,520,655
73 4,520,657
117.3 4,520,658
118 4,520,659
120 4,520,660
129 4,520,661
4,520,662
4,520,663
146.8 4,520,664
155 4,520,665
4,520,666
4,520,667
171 4,520,676
281 4,520,668
300 4,520,656
505 4,520,669
510 4,520,670
602 4,520,671
620 4,520,672
622 4,520,673
623 4,520,674
660 4,520,675
718 4,520,677
861 4,520,678
861.24 4,520,679
862.04 4,520,680
862.19 4,520,681
862.28 4,520,618
310 4,520,619
320.1 4,520,620
400 4,520,621
400.11

CLASS 57

CLASS 74

40 4,520,682
41 4,520,683
89.21 4,520,684
473 R 4,520,685
4,520,686
491 4,520,687
572 4,520,688
595 4,520,689
695 4,520,690
790 4,520,691
799 4,520,692
804 4,520,693
858 4,520,694

CLASS 75

0.5 B 4,521,244
21 4,521,245
42 4,521,246
77 4,521,247
238 4,521,248

CLASS 81

3.07 4,520,695
3.55 4,520,696
62 4,520,697
128 4,520,698
166 4,520,699

CLASS 82

31 4,520,700
36 R 4,520,701

CLASS 83

71 4,520,702
478 4,520,703
499 4,520,704
879 4,520,705

CLASS 84

1.03 4,520,707
1.1 4,520,706
1.26 4,520,708
415 4,520,709
422 R 4,520,710

CLASS 89

1.5 D 4,520,711

CLASS 91

505 4,520,712

CLASS 98

42.19 4,520,713
56 4,520,714
101 4,520,715

CLASS 99

306 4,520,716
337 4,520,717
535 4,520,718
578 4,520,719

CLASS 100

26 4,520,720
88 4,520,721
99 4,520,722
162 B 4,520,723
935 4,520,724

CLASS 101

91 4,520,725
123 4,520,726
127 4,520,727
248 4,520,728
352 4,520,729
426 4,520,730

CLASS 102

527 4,520,731

CLASS 104

53 4,520,732
93 4,520,733

CLASS 105

157 R 4,520,734
215 C 4,520,735

CLASS 106

12 4,521,249
15.05 4,521,250
183 4,521,251
281 R Re.31,905

CLASS 109

60 4,520,736

CLASS 110

171 4,520,737
4,520,738
263 4,520,739
288 4,520,740
344 4,520,741

CLASS 111

86 4,520,742

CLASS 112

255 4,520,743
260 4,520,744
266.1 4,520,745

CLASS 114

69 4,520,746
347 4,520,747

CLASS 116

70 4,520,748
325 4,520,749

CLASS 118

58 4,520,750
203 4,520,751
405 4,520,752
500 4,520,753
626 4,520,754
629 4,520,755
699 4,520,756
723 4,520,757

CLASS 119

19 4,520,758
28 4,520,759

CLASS 122

7 R 4,520,760
31 R 4,520,761
406 ST 4,520,762

CLASS 123

1 A 4,520,763
3 4,520,764
27 GE 4,520,766
27 R 4,520,765
41.1 4,520,767
41.44 4,520,768
142.5 R 4,520,769
195 H 4,520,770
4,520,771
198 A 4,520,773
198 DB 4,520,772
300 4,520,774
308 4,520,775
4,520,776
339 4,520,777
352 4,520,778
357 4,520,779
359 4,520,780
414 4,520,781
450 4,520,782
492 4,520,783
4,520,784
525 4,520,785
536 4,520,786
556 4,520,787

CLASS 125

11 CD 4,520,788

CLASS 126

91 A 4,520,789
109 4,520,790
121 4,520,791
175 4,520,792
426 4,520,793
438 4,520,794
443 4,520,795
445 4,520,796

CLASS 127

46.3 4,521,252

CLASS 128

20 4,520,797
24 R 4,520,798
67 4,520,799
72 4,520,800
75 4,520,801
80 A 4,520,803
80 C 4,520,802
4,520,804
80 R 4,520,805
87 R 4,520,806
132 D 4,520,807
200.14 4,520,808
200.24 4,520,809
200.26 4,520,810
203.11 4,520,811
204.25 4,520,812
207.17 4,520,813
303 R 4,520,815
303.1 4,520,814
4,520,816
303.17 4,520,818
305 4,520,817
327 4,520,819
4,520,820
334 R 4,520,821
335.5 4,520,822
348.1 4,520,823
395 4,520,824
422 4,520,825
4,520,826
423 W 4,520,827
653 4,520,828
654 4,520,829
660 4,520,830

CLASS 132

11 R 4,520,831
33 R 4,520,832
90 4,520,833

CLASS 134

3 4,521,253
26 4,521,254
33 4,521,255
63 4,520,834

CLASS 135

102 4,520,835

CLASS 136

234 4,521,639
250 4,521,640

CLASS 137

59 4,520,836
68 R 4,520,837
69 4,520,838
202 4,520,839
259 4,520,840
270 4,520,841
327 4,520,842
469 4,520,843
486 4,520,844
624.27 4,520,845
625.3 4,520,846
625.43 4,520,847

CLASS 139

1 R 4,520,848
116 4,520,849
194 4,520,850
448 4,520,851

CLASS 141

86 4,520,852
168 4,520,853

CLASS 144

193 A 4,520,854

CLASS 148

1.5 4,521,256
11.5 Q 4,521,257
12 F 4,521,258
20.3 4,521,259

CLASS 149

19.91 4,521,260
92 4,521,261

CLASS 150

52 G 4,520,855

CLASS 152

454 4,520,856
527 4,520,857

CLASS 156

150 4,521,262

159 4,521,263
184 4,521,264
229 4,521,265
242 4,521,266
249 4,521,267
345 4,521,268
420 4,521,269
429 4,521,270
568 4,521,271
616 R 4,521,272
630 4,521,273
643 4,521,274
4,521,275

CLASS 159

1 W 4,521,276

CLASS 164

34 4,520,858
253 4,520,859
415 4,520,860
473 4,520,861

CLASS 165

10 4,520,862
12 Re.31,903
48 R 4,520,863
60 4,520,864
104.26 4,520,865
115 4,520,866
144 4,520,867
158 4,520,868

CLASS 166

241 4,520,869
317 4,520,870

CLASS 169

43 4,520,871
54 4,520,872

CLASS 172

47 4,520,873
49.5 4,520,874
126 4,520,875
427 4,520,876
643 4,520,877
705 4,520,878

CLASS 173

57 4,520,879
135 4,520,886

CLASS 174

50.64 4,521,641
70 S 4,521,642

CLASS 175

51 4,520,880
329 4,520,881
410 4,520,882

CLASS 177

1 4,520,883
58 4,520,884
210 C 4,520,885

CLASS 179

2 DP 4,521,643
4,521,644
5 R 4,521,645
84 VF 4,521,647
90 B 4,521,648

CLASS 180

68.5 4,520,887
125 4,520,888
168 4,520,889
193 4,520,890
219 4,520,891
4,520,892
326 4,520,893

CLASS 182

2 4,520,894
3 4,520,895
22 4,520,896
92 4,520,897
113 4,520,898
230 4,520,899
238 4,520,900

CLASS 184

3.1 4,520,901
7.4 4,520,902

CLASS 187

9 R 4,520,903
29 R 4,520,904
4,520,905
4,520,906

CLASS 188

156 4,520,907
319 4,520,908

CLASS 192

0.02 R 4,520,909
4,520,910
13 A 4,520,911
48.8 4,520,913
71 4,520,914
85 AA 4,520,912
106.2 4,520,915
4,520,916

CLASS 196

46 4,521,277

CLASS 198

499 4,520,917
640 4,520,918
648 4,520,919
761 4,520,920

CLASS 200

50 B 4,521,649
61.88 4,521,650
83 R 4,521,651
84 B 4,521,652
144 C 4,521,653
146 R 4,521,654
147 R 4,521,655
148 B 4,521,656
148 R 4,521,657

CLASS 201

17 4,521,278

CLASS 202

227 4,521,279

CLASS 204

15 4,521,280
25 4,521,281
52 R 4,521,282
59 R 4,521,283
71 4,521,284
72 4,521,285
192 E 4,521,286
192 SP 4,521,287
213 4,521,288
253 4,521,289
412 4,521,290

CLASS 206

1.5 4,520,921
5.1 4,520,923
44 R 4,520,922
150 4,520,924
334 4,520,925
366 4,520,926
387 4,520,927
505 4,520,928
610 4,520,929
628 4,520,930

CLASS 208

8 LE 4,521,291
11 LE 4,521,293
11 R 4,521,292
23 4,521,294
59 4,521,295
87 4,521,296
89 4,521,297
120 4,521,298
254 R 4,521,299

CLASS 209

166 4,521,300
4,521,301
441 4,521,302
454 4,521,303
542 4,520,931
545 4,520,932
606 4,520,933

CLASS 210

96.1 4,521,304
158 4,521,305
159 4,521,306
194 4,521,307
330 4,521,308
493.2 4,521,309
603 4,521,310
616 4,521,311
744 4,521,312
776 4,521,313
777 4,521,314
784 4,521,315

CLASS 211

41 4,520,934
124 4,520,935

CLASS 215

1 C 4,520,936
10 4,520,937
220 4,520,938
252 4,520,939

CLASS 217

121 PY 4,521,666

CLASS 219

10.55 B 4,521,658
10.77 4,521,659
69 W 4,521,660
4,521,661
4,521,662
76.14 4,521,663
4,521,664
117.1 4,521,665
121 LC 4,521,668
121 LJ 4,521,667
125.11 4,521,669
130.01 4,521,670
130.31 4,521,671
130.33 4,521,672
230 4,521,673
270 Re.31,908
299 4,521,674

CLASS 220

68 4,520,940
72 4,520,941
257 4,520,942
281 4,520,943
305 4,520,944
315 4,520,945

CLASS 221

63 4,520,946

CLASS 222

4,520,947
103 4,520,948
108 4,520,949
129.1 4,520,950
182 4,520,951
199 4,520,952
396 4,520,953
400.8 4,520,954

CLASS 223

044 4,520,955

CLASS 227

120 4,520,956

CLASS 229

17 R 4,520,957
72 4,520,958

CLASS 235

90 4,521,675
375 4,521,676
385 4,521,677
472 4,521,678
492 4,521,679

CLASS 236

49 4,520,959

CLASS 239

29 4,520,960
284 R 4,520,961
585 4,520,962

CLASS 241

30 4,520,963
55 4,520,964

CLASS 242

7.05 B 4,520,965
54 R 4,520,966
55 4,520,967
55.3 4,520,968
71.8 4,520,969
195 4,520,970
220 4,520,971

CLASS 244

3.1 4,520,972
3.16 4,520,973
54 4,520,974
137 R 4,520,975

CLASS 248

56 4,520,976
201 4,520,977
220.4 4,520,978
323 4,520,979
351 4,520,980
413 4,520,981
430 4,520,982
481 4,520,983
489 4,520,984
530 4,520,985
585 4,520,986
635 4,520,987

CLASS 249

13 4,520,988
4,520,989
47 4,520,990
122 4,520,991

CLASS 250

201 4,521,680
205 4,521,681
211 J 4,521,682
221 4,521,683
227 4,521,684
229 4,521,685
237 R 4,521,686
296 4,521,687
363 S 4,521,688
385 4,521,689
455.1 4,521,690
506.1 4,521,691

CLASS 251

48 4,520,992
57 4,520,993
58 4,520,994
162 4,520,995

CLASS 252

8.55 D 4,521,317
8.55 R 4,521,316
46.7 4,521,318
47.5 4,521,319
4,521,320
49.3 4,521,321
51.5 R 4,521,330
62.59 4,521,323
62.9 4,521,322
73 4,521,324
77 4,521,325
174.21 4,521,326
299.61 4,521,327
502 4,521,328
512 4,521,329
522 R 4,521,331
527 4,521,332
606 4,521,333

CLASS 254

9 C 4,520,996
26 R 4,520,997
267 4,520,998
278 4,520,999
391 4,521,000

CLASS 260

112.5 R 4,521,334
4,521,335
239 A 4,521,338
239.3 B 4,521,339
245.2 T 4,521,340
371 4,521,341
410 4,521,342
419 4,521,343
465 D 4,521,344
465 F 4,521,345
543 P 4,521,346
4,521,347
940 4,521,348

CLASS 261

93 4,521,349
111 4,521,350

CLASS 264

1.5 4,521,351
4.3 4,521,352
8 4,521,353
46.6 4,521,354
60 4,521,355
4,521,356
63 4,521,357
65 4,521,358
104 4,521,359
108 4,521,360
126 4,521,361
136 4,521,362
174 4,521,363
176 F 4,521,364
306 4,521,365
312 4,521,366
318 4,521,367
514 4,521,368
532 4,521,369

CLASS 266

208 4,521,001

CLASS 267

8 R 4,521,002
57.1 A 4,521,003
141.4 4,521,004
179 4,521,005

CLASS 269

304 4,521,006

CLASS 270

47 4,521,007

CLASS 271

3 4,521,008

CLASS 272

73 4,521,009
4,521,010
4,521,012
116 4,521,011
136 4,521,013

CLASS 273

1 GC 4,521,014
26 B 4,521,015
29 A 4,521,016
30 4,521,017
32 A 4,521,018
49 4,521,019
85 G 4,521,020
148 B 4,521,021
175 4,521,022
183 B 4,521,023
271 4,521,024

CLASS 277

89 4,521,025
134 4,521,026
152 4,521,027

CLASS 279

1 C 4,521,028

CLASS 280

7.14 4,521,029
42 4,521,030
293 4,521,031
605 4,521,032
700 4,521,033
804 4,521,034

CLASS 281

48 4,521,035

CLASS 285

15 4,521,037
24 4,521,038
41 4,521,039
61 4,521,036
140 4,521,040
156 4,521,041
334 4,521,042

CLASS 290

4 A 4,521,692

CLASS 294

19.1 4,521,043
82.24 4,521,044
149 4,521,045

CLASS 296

97 H 4,521,051
97 K 4,521,046
4,521,047
160 4,521,048
185 4,521,049
192 4,521,050

CLASS 297

3 4,521,052
312 4,521,053
357 4,521,054
362 4,521,055
412 4,521,056
455 4,521,057

CLASS 299

81 4,521,058

CLASS 301

36 R 4,521,059

CLASS 303

71 4,521,060
114 4,521,061

CLASS 307

252 T 4,521,693
266 4,521,694
279 4,521,695
350 4,521,696
355 4,521,697
450 4,521,698
456 4,521,699
4,521,700
482 4,521,701
520 4,521,702
530 4,521,703
4,521,704
605 4,521,705

CLASS 310

67 R 4,521,706
80 4,521,707
87 4,521,708
186 4,521,709
234 4,521,710
313 B 4,521,711
339 4,521,712

CLASS 313

378 4,521,713
422 4,521,714
531 4,521,715
594 4,521,716

CLASS 315

39 4,521,717
99 4,521,718
111.81 4,521,719
386 4,521,720

CLASS 318

573 4,521,721
578 4,521,722
696 4,521,723
762 4,521,724

CLASS 323

282 4,521,725
283 4,521,726
294 4,521,727

CLASS 324

58 R 4,521,728
71.1 4,521,729
158 F 4,521,730
174 4,521,731
300 4,521,732
309 4,521,733
313 4,521,734
433 4,521,735

CLASS 329

102 4,521,736

CLASS 330

51 4,521,737
134 4,521,738
257 4,521,739
267 4,521,740
277 4,521,741
289 4,521,742
296 4,521,743

CLASS 331

1 A 4,521,744
2 4,521,745
96 4,521,746
107 SL 4,521,747
108 D 4,521,748

CLASS 332

17 4,521,749

CLASS 333

28 R 4,521,750
151 4,521,751
165 4,521,752
204 4,521,753
224 4,521,754
244 4,521,755

CLASS 335

21 4,521,756
79 4,521,757
131 4,521,758
255 4,521,759

CLASS 337

368 4,521,760

CLASS 338

174 4,521,761

CLASS 339

14 R 4,521,062
17 LM 4,521,063
45 M 4,521,064
75 MP 4,521,085
89 M 4,521,066
237 4,521,067

CLASS 340

347 AD 4,521,763
347 DA 4,521,762
4,521,764
4,521,765
347 DD 4,521,766
555 4,521,767
566 4,521,768
635 4,521,769
703 4,521,770
705 4,521,771
710 4,521,772
4,521,773
745 4,521,774
784 4,521,775
825.44 4,521,776
995 4,521,777

CLASS 343

13 R 4,521,778
17.2 PC 4,521,779
17.7 4,521,780
700 MS 4,521,781
765 4,521,782
781 R 4,521,783
846 4,521,784

CLASS 346

25 4,521,785
140 R 4,521,786
4,521,787
4,521,788
4,521,789
154 4,521,790
159 4,521,791
4,521,792
201 4,521,793

CLASS 350

1.1	4,521,068
96.13	4,521,069
96.15	4,521,070
96.18	4,521,071
96.23	4,521,072
96.34	4,521,073
145	4,521,074
162.11	4,521,075
254	4,521,076
319	4,521,077
334	4,521,078
339 R	4,521,079
341	4,521,080
357	4,521,081
405	4,521,082
414	4,521,083
432	4,521,084
	4,521,085
464	4,521,086
574	4,521,087
582	4,521,088
	4,521,089

CLASS 351

124	4,521,090

CLASS 353

122	4,521,091

CLASS 354

320	4,521,092
403	4,521,093
423	4,521,094

CLASS 355

3 DD	4,521,098
3 FU	4,521,095
3 R	4,521,096
	4,521,097
8	4,521,099
	4,521,100
10	4,521,101
14 CU	4,521,102
14 D	4,521,103
20	4,521,104
64	4,521,105

CLASS 356

1	4,521,106
5	4,521,107
123	4,521,108
349	4,521,109
350	4,521,110
367	4,521,111
375	4,521,112
387	4,521,113
401	4,521,114
432	4,521,115

CLASS 357

2	4,521,794
23.4	4,521,795
23.5	4,521,796
24	4,521,797
30	4,521,798
51	4,521,799
67	4,521,800
71	4,521,801
81	4,521,170

CLASS 358

11	4,521,802
12	4,521,803
51	4,521,804
75	4,521,805
86	4,521,806
106	4,521,807
111	4,521,808
120	4,521,809
181	4,521,810
243	4,521,811
287	4,521,812
296	4,521,813
	4,521,814

CLASS 360

10.2	4,521,815
45	4,521,816
46	4,521,817
65	4,521,818
97	4,521,819
133	4,521,820
137	4,521,821

CLASS 361

35	4,521,822
38	4,521,823
45	4,521,824
253	4,521,825
314	4,521,826
386	4,521,827
	4,521,828
387	4,521,829
433	4,521,830

CLASS 362

32	4,521,831
103	4,521,832
116	4,521,833
139	4,521,834
145	4,521,836
183	4,521,835
216	4,521,837
219	4,521,838
238	4,521,839

CLASS 363

35	4,521,840
45	4,521,841
71	4,521,842

CLASS 364

145	4,521,843
167	4,521,844
171	4,521,845
184	4,521,847
200	4,521,846
	4,521,848
	4,521,849
	4,521,850
	4,521,851
	4,521,852
	4,521,853
	4,521,858
400	4,521,854
426	4,521,856
431.06	Re.31,906
434	4,521,855
439	4,521,857
472	4,521,859
474	4,521,860
517	4,521,861
552	4,521,862
561	4,521,863
563	4,521,864
608	4,521,865
724	4,521,866
	4,521,867
753	4,521,868
900	4,521,869
	4,521,870
	4,521,871

CLASS 365

49	4,521,872
190	4,521,873
221	4,521,874

CLASS 366

25	Re.31,904
54	4,521,116
165	4,521,117

CLASS 367

130	4,521,875

CLASS 369

54	4,521,876
173	4,521,877

CLASS 370

19	4,521,878
62	4,521,879
68	4,521,880
72	4,521,881
85	4,521,882
100	4,521,883

CLASS 371

15	4,521,884
29	4,521,885
43	4,521,886

CLASS 372

45	4,521,887
50	4,521,888
87	4,521,889

CLASS 373

22	4,521,890

CLASS 374

5	4,521,118
56	4,521,119
102	4,521,120

CLASS 375

8	4,521,891
88	4,521,892
107	4,521,893
122	4,521,646

CLASS 376

233	4,521,370
245	4,521,371
250	4,521,372
258	4,521,373
462	4,521,374

CLASS 377

16	4,521,894
21	4,521,895
60	4,521,896
115	4,521,897
116	4,521,898

CLASS 378

40	4,521,899
137	4,521,900
138	4,521,901
	4,521,902
141	4,521,903
185	4,521,904
206	4,521,905

CLASS 381

24	4,521,906
47	4,521,907
92	4,521,908

CLASS 382

38	4,521,909

CLASS 383

10	4,521,910
20	4,521,911

CLASS 384

100	4,521,121

CLASS 400

124	4,521,122
	4,521,123
144.2	4,521,124
208	4,521,125

CLASS 401

65	4,521,126
68	4,521,127
183	4,521,128

CLASS 404

10	4,521,129

CLASS 405

116	4,521,131
166	4,521,132
195	4,521,133
198	4,521,134
224	4,521,135
263	4,521,136
283	4,521,137
284	4,521,138

CLASS 406

19	4,521,139
86	4,521,130

CLASS 408

97	4,521,140

CLASS 409

48	4,521,141
82	4,521,142
200	4,521,143
218	4,521,144
	4,521,145

CLASS 411

1	4,521,146
43	4,521,147
182	4,521,148

CLASS 414

44	4,521,149
749	4,521,150

CLASS 415

2 R	4,521,152
11	4,521,156
131	4,521,151
146	4,521,153
190	4,521,155

CLASS 416

134 A	4,521,157
160	4,521,158
174	4,521,159
175	4,521,154
218	4,521,160

CLASS 417

68	4,521,161
138	4,521,162
238	4,521,163
307	4,521,164
393	4,521,165
478	4,521,166

CLASS 418

69	4,521,169
82	4,521,167
137	4,521,168

CLASS 422

29	4,521,375
56	4,521,376
92	4,521,377
135	4,521,378
209	4,521,379
273	4,521,380

CLASS 423

49	4,521,381
68	4,521,382
	4,521,383
72	4,521,384
76	4,521,385
157	4,521,386
210	4,521,387
235	4,521,388
	4,521,389
239	4,521,390
307	4,521,391
317	4,521,392
344	4,521,393
363	4,521,394
376	4,521,395
474	4,521,397
579	4,521,398
620	4,521,399
658.5	4,521,400

CLASS 424

19	4,521,401
	4,521,402
51	4,521,403
71	4,521,404
92	4,521,405
94	4,521,406
95	4,521,407
115	4,521,408
195.1	4,521,411

CLASS 425

2	4,521,171
73	4,521,172
113	4,521,173
194	4,521,174
403	4,521,175
521	4,521,176
533	4,521,177
548	4,521,178
	4,521,179

CLASS 426

36	4,521,433
59	4,521,434
92	4,521,435
104	4,521,436
130	4,521,437
271	4,521,438
509	4,521,439
602	4,521,440

CLASS 427

38	4,521,441
	4,521,442
	4,521,443
41	4,521,444
44	4,521,445
45.1	4,521,447
86	4,521,446
88	4,521,448
96	4,521,449
121	4,521,450
130	4,521,451
136	4,521,452
140	4,521,453
168	4,521,454
178	4,521,455
207.1	4,521,456
286	4,521,457
294	4,521,458
359	4,521,459
385.5	4,521,460
387	4,521,461
421	4,521,462
435	4,521,463

CLASS 428

33	4,521,464
35	4,521,465
	4,521,466
	4,521,467
	4,521,468
	4,521,469
36	4,521,470
40	4,521,471
53	4,521,472
82	4,521,473
93	4,521,474
142	4,521,475
209	4,521,476
282	4,521,477
287	4,521,478
326	4,521,479
328	4,521,480
336	4,521,481
	4,521,482
373	4,521,483
374	4,521,484
383	4,521,485
407	4,521,486
	4,521,487
409	4,521,488
412	4,521,489
416	4,521,490
458	4,521,491
464	4,521,492
498	4,521,493
514	4,521,494
537.1	4,521,495
551	4,521,496

CLASS 429

27	4,521,497
59	4,521,498
111	4,521,499
174	4,521,500

CLASS 430

24	4,521,501
42	4,521,502
49	4,521,503
57	4,521,504
112	4,521,505
241	4,521,506
503	4,521,507
567	4,521,508

CLASS 431

25	4,521,180
207	4,521,181

CLASS 432

13	4,521,182
37	4,521,183
60	4,521,184

CLASS 433

31	4,521,185
71	4,521,186
72	4,521,187
74	4,521,188
84	4,521,189
132	4,521,190
164	4,521,191
173	4,521,192
199	4,521,193
215	4,521,194

CLASS 434

16	4,521,195
20	4,521,196
110	4,521,197
224	4,521,198
339	4,521,199

CLASS 435

6	4,521,509
7	4,521,510
28	4,521,511
35	4,521,512
68	4,521,513
70	4,521,514
248	4,521,515
253	4,521,516
313	4,521,517

CLASS 436

10	4,521,518
17	4,521,519
66	4,521,520
517	4,521,521
525	4,521,522

CLASS 440

23	4,521,200
55	4,521,201
61	4,521,202

CLASS 441

64	4,521,220

CLASS 446

106	4,521,203
198	4,521,204
302	4,521,205
444	4,521,206

CLASS 455

115	4,521,912
121	4,521,913
158	4,521,914
165	4,521,915
182	4,521,916
223	4,521,917
343	4,521,918
344	4,521,919
619	4,521,920

CLASS 474

56	4,521,207
101	4,521,208

CLASS 493

432	4,521,209

CLASS 501

30	4,521,523
65	4,521,524
98	4,521,525

CLASS 502

24	4,521,526
184	4,521,527
208	4,521,528
217	4,521,529
218	4,521,530
242	4,521,531
439	4,521,532

CLASS 514

21	4,521,409
26	4,521,410
80	4,521,533
203	4,521,413
211	4,521,430
219	4,521,534
222	4,521,535
226	4,521,536
229	4,521,414
244	4,521,412
252	4,521,415
	4,521,416
255	4,521,417
258	4,521,422
259	4,521,420
267	4,521,419
	4,521,421
272	4,521,418
277	4,521,428
290	4,521,423
302	4,521,537
314	4,521,424
315	4,521,619
346	4,521,426
350	4,521,425
354	4,521,427
383	4,521,429
423	4,521,538
461	4,521,539
471	4,521,431
556	4,521,432

CLASS 518

717	4,521,540

CLASS 521

79	4,521,541
89	4,521,542
103	4,521,543
107	4,521,544
	4,521,545
137	4,521,546
	4,521,547
167	4,521,548

CLASS 523

116	4,521,550
120	4,521,551
173	4,521,549
313	4,521,552
333	4,521,553
522	4,521,554

CLASS 524

63	4,521,555
88	4,521,556
94	4,521,557
145	4,521,558
289	4,521,559
371	4,521,560
406	4,521,596
459	4,521,561
490	4,521,562
555	4,521,563

CLASS 525

54.1	4,521,564
64	4,521,565
247	4,521,566
261	4,521,567
276	Re.31,907
309	4,521,568
316	4,521,569
415	4,521,570
437	4,521,571
507	4,521,572

CLASS 526

125	4,521,573
204	4,521,574
206	4,521,575
213	4,521,576
261	4,521,577
287	4,521,579
288	4,521,578
307.2	4,521,580
340.2	4,521,587

CLASS 528

57	4,521,581
67	4,521,582
119	4,521,583
214	4,521,584
271	4,521,585
297	4,521,586
363	4,521,588
380	4,521,589
502	4,521,590

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127		4,521,595
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3		4,521,597
16		4,521,598
97		4,521,599
352		4,521,600
CLASS 546		
45		4,521,601
184		4,521,602
304		4,521,603
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301		4,521,604
440		4,521,605
503		4,521,606
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39		4,521,607
397		4,521,608
533		4,521,609
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27		4,521,610
91		4,521,611
124		4,521,612
152		4,521,613
193		4,521,614
198		4,521,615
CLASS 562		
456		4,521,616
467		4,521,617
535		4,521,618
CLASS 564		
128		4,521,620
307		4,521,621
406		4,521,622
430		4,521,623
446		4,521,624
461		4,521,625
487		4,521,626
511		4,521,627
CLASS 568		
1		4,521,628
313		4,521,629
435		4,521,630
478		4,521,631
492		4,521,632
639		4,521,633
659		4,521,635
		4,521,636
		4,521,637
665		4,521,634
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640		4,521,638
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8		4,521,210
85		4,521,211
126		4,521,212
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	28	279,041
	29	279,042
		279,043
	320	279,044
D3—	35	279,045
	36	279,046
		279,047
	71	279,048
D4—	106	279,049
D6—	316	279,051
	334	279,052
	348	279,050
	361	279,053
	362	279,054
	373	279,055
	381	279,056
	399	279,057
	453	279,058
	482	279,059
	502	279,060
	509	279,061
	545	279,062
		279,063
	561	279,064
D7—	17	279,065
		279,066
	37	279,067
	312	279,068
	325	279,069
		279,070
	359	279,071
	386	279,072
	402	279,073
D8—	14.1	279,074
	30	279,075
	102	279,076
D9—	371	279,077
	376	279,078
	410	279,079
	453	279,080
D10—	38	279,081
D11—	43	279,082
	152	279,083
	155	279,084
		279,085
D12—	110	279,086
	147	279,087
		279,088
		279,089
	149	279,090
	151	279,091
	162	279,092
	211	279,093
	340	279,094
D14—	5	279,095
		279,096
	6	279,097
	70	279,098
	73	279,099
	115	279,100
D15—	5	279,101
D17—	20	279,102
	22	279,103
D18—	2	279,104
	7	279,105
		279,106
		279,107
		279,108
		279,109
		279,110
	10	279,111
	12	279,112
D19—	26	279,113
	42	279,114
	51	279,115
D21—	34	279,116
	65	279,117
	120	279,118
	159	279,119
	191	279,120
	208	279,121
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D23—	32	279,123
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D24—	4	279,125
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D26—	3	279,127
		279,128
	9	279,129
	37	279,131
	62	279,130
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		5,487

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	4,520,879	4,520,893	4,521,485	09 : Re.31,903	4,521,743	4,521,492
	4,521,110	4,520,897	4,521,499	Re.31,908	4,521,776	4,521,516
	4,521,229	4,520,918	4,521,525	4,520,567	4,521,806	4,521,611
	4,521,782	4,520,920	4,521,610	4,520,644	13 : 4,520,605	4,521,620
02 :	4,520,872	4,520,926	4,521,623	4,520,739	4,520,687	4,521,650
04 :	4,520,529	4,520,928	4,521,647	4,520,760	4,521,036	4,521,720
	4,520,715	4,520,935	4,521,652	4,520,808	4,521,147	4,521,722
	4,521,067	4,520,941	4,521,678	4,520,817	4,521,367	4,521,726
	4,521,187	4,520,945	4,521,686	4,520,832	4,521,464	4,521,727
	4,521,441	4,520,946	4,521,690	4,520,904	4,521,834	4,521,752
	4,521,692	4,520,953	4,521,693	4,521,015	4,521,902	4,521,800
	4,521,697	4,520,954	4,521,699	4,521,017	15 : 4,520,525	4,521,828
	4,521,737	4,520,970	4,521,734	4,521,109	16 : 4,520,921	4,521,856
	4,521,765	4,520,973	4,521,736	4,521,161	17 : 4,520,563	4,521,880
	4,521,799	4,520,975	4,521,746	4,521,281	4,520,564	4,521,897
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	4,521,851	4,520,992	4,521,762	4,521,371	4,520,602	4,520,546
	4,521,898	4,520,997	4,521,770	4,521,530	4,520,603	4,520,627
05 :	4,521,911	4,521,012	4,521,771	4,521,533	4,520,617	4,520,707
06 :	4,520,514	4,521,018	4,521,772	4,521,544	4,520,620	4,520,767
	4,520,526	4,521,021	4,521,773	4,521,546	4,520,652	4,520,798
	4,520,527	4,521,022	4,521,783	4,521,563	4,520,682	4,520,875
	4,520,528	4,521,037	4,521,791	4,521,583	4,520,720	4,520,894
	4,520,537	4,521,040	4,521,792	4,521,615	4,520,748	4,521,026
	4,520,555	4,521,062	4,521,818	4,521,824	4,520,759	4,521,128
	4,520,585	4,521,066	4,521,835	4,521,895	4,520,800	4,521,146
	4,520,647	4,521,095	4,521,839	4,521,910	4,520,868	4,521,173
	4,520,648	4,521,114	4,521,843	10 : 4,521,111	4,520,912	4,521,302
	4,520,650	4,521,118	4,521,854	4,521,241	4,520,924	4,521,399
	4,520,654	4,521,135	4,521,855	4,521,263	4,520,944	4,521,421
	4,520,656	4,521,166	4,521,858	4,521,493	4,520,955	4,521,562
	4,520,671	4,521,182	4,521,870	4,521,510	4,520,960	4,521,598
	4,520,691	4,521,189	4,521,874	4,521,521	4,520,978	4,521,669
	4,520,696	4,521,198	4,521,875	4,521,557	4,520,981	4,521,810
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	4,520,793	4,521,211	4,521,891	12 : 4,520,558	4,521,010	4,521,826
	4,520,795	4,521,220	4,521,900	4,520,599	4,521,014	4,521,915
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	4,520,801	4,521,278	08 : 4,520,763	4,520,786	4,521,197	4,521,658
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	4,520,805	4,521,308	4,520,819	4,521,085	4,521,207	4,520,983
	4,520,806	4,521,319	4,520,820	4,521,116	4,521,212	4,521,354
	4,520,810	4,521,370	4,520,923	4,521,167	4,521,213	4,521,511
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DESIGN PATENTS

01	279,121		279,116		279,070	26	279,093		279,053	41	279,124
	279,131		279,129		279,077		279,114		279,055	42	279,040
06	279,042		279,133	18	279,134	27	279,050		279,071	44	279,111
	279,043	08	279,089	19	279,041		279,120		279,099	45	279,088
	279,060	09	279,058		279,069	29	279,101		279,132	47	279,102
	279,074	12	279,059	21	279,048		279,118	37	279,056	48	279,122
	279,080		279,061		279,123	32	279,092	39	279,062	50	279,130
	279,083	13	279,063	22	279,051	33	279,044		279,087	53	279,094
	279,113	17	279,068	24	279,045	36	279,052				

PLANT PATENTS

01	5,485	06	5,486	5,487	25	5,482	5,483	5,484

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[Notice of Dec. 16, 1969, 869 O.G. 6877]

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